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**Risk perception, priority of safety,
and demand for risk mitigation in
transport**

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Preface

The main aims of the thesis were to investigate perception of risk, intention to prioritize safety when choosing means of transportation, and demand for risk mitigation in the Norwegian public. The results are based on two questionnaire surveys carried out in 2004.

In terms of structure this thesis consists of three papers and a theoretical introduction which are based on two survey studies conducted in 2004. The introduction contains a general discussion, and the specific findings are discussed in the respective papers. Due to this structure, some reiterations may occur throughout the text.

The present thesis was supported by grants from the Research Council of Norway (NFR), and is a part of their 'Risk and Safety in Transport' programme (RISIT). The objective of the programme is to produce knowledge that can give a better understanding of transport risks and a better basis for risk management within the transport sector. The research presented in the thesis represents some of the results from the sub-project 'Risk judgement, risk tolerance and demand for risk mitigation in transport'. The studies included have been presented at RISIT seminars and several conferences. The author would like to thank the Research Council of Norway for financing the project.

During the work on this thesis, I received expert guidance from my supervisor Professor Torbjørn Rundmo and would like to thank him for the help he provided. His enthusiasm and commitment were very supportive.

Trondheim, September 2007

Björg-Elin Moen

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List of papers

Paper I: Moen, B.E. & Rundmo, T. (2006). Perception of transport risk in the Norwegian public. *Risk Management: An International Journal*, 8, 43-60.

Paper II: Moen, B.E.(2007). Determinants of safety priorities in transport - The effect of personality, worry, optimism, attitudes and willingness to pay. *Safety Science*, 45, 848-863.

Paper III: Moen, B.E. Applying the risk-as-feelings framework to explain demand for risk mitigation. *Transportation Research Part F: Traffic Psychology and Behaviour* (submitted).

Summary

The main purpose of the present study was to examine how risk is perceived by the Norwegian public as well as related priorities of safety and demands for risk mitigation. Based on two questionnaire surveys, different evaluations related to 10 means of transportation were studied. In addition, factors found to be important for different aspects of transportation risks, i.e. personality variables, driver optimism, worry, negative attitudes towards rules, and willingness to pay to increase safety were scrutinized further.

The present thesis consists of three studies. The first study aims to explore risk perception. More specifically, it investigates whether probability assessment, evaluation of consequences or worry is most important for general risk perception. The results showed that transport risks consisted of two main categories: public and private means of transportation. Respondents assessed the probability of experiencing risk when using private transportation as higher than when using public transportation. The consequences, should an accident occur, were perceived as higher when using public transportation than when using private means of transportation. In addition, when comparing personal and general risk, personal risk was reported to be lower than general risk. The associated general worry about others being exposed to transport-related hazards was also higher. Related to risk perception, the analyses showed that, overall, worry was the most important predictor. However, females emphasized worry related to both public and private transportation, whereas with men worry was found to be most important only in relation to public transportation. For men, probability assessments (i.e. cognitive evaluations) were found to be most important to private means of transportation. This implies a difference in perceived risk, and hence a differentiation on how risk should be communicated to the public dependent on the target group. More knowledge on risk perception may contribute to development of the best way to inform the public about potential danger. It may be necessary to direct this information to specific groups.

Faced with risk, several possible responses are possible, e.g. seek additional risk, do more of the same, or take actions to increase safety. Hence, it is interesting to know more about factors related to prioritizing safety. The second study proposes a model for potential predictors of priorities of safety. Based on findings from the first questionnaire, a measurement of intention to

prioritize safety was developed. Several factors were investigated in relation to priorities. First, the personality traits anxiety, excitement-seeking, and trust were included. Further factors were driver optimism, worry related to transport risks, willingness to pay to increase safety, and negative attitudes towards traffic rules. The further analyses investigated what influences priorities of safety, and involved a regression analysis and a structural equation model. A path model was used to test the five determinants of priority of safety. The findings indicated that the personality trait anxiety did not have a direct effect on priority of safety, but had an indirect effect through worry related to transport risks. On this basis, it was concluded that the personality trait anxiety primarily influences worry and attitudes. Driver optimism and willingness to pay had a positive effect, whereas negative attitudes towards traffic rules (as a driver) and excitement-seeking had a negative effect on priorities of safety. Worry was found to be the most important predictor of safety priorities. The model explained 44% of the variance in priority of safety. The effect of worry was investigated further and a total beta value of worry was found to be as high as 0.50. The findings indicate that worry related to transport risks, as well as that negative attitudes should not be underestimated when it comes to priority of safety.

The objective of the third study was to investigate the applicability of the risk-as-feeling framework to explain demand for risk mitigation. Behavioural intentions were measured through questions about how highly the respondents prioritized safety when using different means of transportation. Hence, compared to the risk-as-feelings hypothesis priorities were investigated as behavioural intentions and mitigation demands were seen as the outcome of this process. Personal risk assessments of private means of transportation – car, motorcycle, scooter, bike, and walking (pedestrian) were used in the study. A structural equation modelling analysis was performed to investigate the applicability of the risk-as-feelings framework to explain demand for risk mitigation. The fit of the data to the theoretical model was found to be satisfactory. The results showed that the risk-as-feelings framework explained 30 per cent of demand for risk mitigation. Behavioral intentions as priorities were found to be an important predictor of mitigation demands. Probability assessment and consequence evaluation were found to be important to cognitive risk assessment and feelings. When including age, gender, and education the model could explain up to 52 per cent of the variance in risk mitigation demands and 55 per cent of the variance in general risk assessment.

1. Introduction

1.1. Background and aims

Risk is ubiquitous and cannot be avoided, and even if risk is reduced, ‘there is no such thing as zero risk or absolutely safety’ (British Medical Association, 1990, p. xiv). Although everyone seeks to manage risk, they are all guessing, because if they knew for certain, they would not be dealing with risk (Adams, 1995). The British Medical Association also found that there is no such thing as zero risk or absolute safety (1990). This means that everything we do, or that is done to us, carries some risk to our health and welfare (Berry, 2004). In any definite situation, an adverse outcome may or may not occur, and causative factors skew the probabilities of diverse outcomes (Graham & Rhomberg, 1996). Put simply, the ability to sense and deal with risk is necessary for the survival of all living organisms. In this process, several factors influence the individual’s risk perception, such as probability assessment, evaluation of consequences should an accident occur and worry related to a potential negative event. After perceiving something as a potential risk source, a decision about related behaviour has to be made, as well as the acceptability of the risk. If the risk is perceived as too high the individual may choose to take action to reduce the risk. The core aim of the thesis is to gain a better understanding of the relation between how people perceive and understand transport risks on the one hand, and risk decisions and demand for risk mitigation on the other.

This study does not investigate the topic of decision-making under immediate risk, but rather the influence of both cognitive and emotional processes in risk judgments. According to Loewenstein, Weber, Hsee, and Welch (2001) rule-based processing should be occurring in these subjects because they can sit safely in their homes and assess potential risk sources. Hence, the initial assumption may be that cognitive processes would be more important in these estimations than they would in any given situation where a risk is present. However, anticipatory emotional reactions sometimes diverge from cognitive evaluations, and when they do, the emotional reactions often exert a dominating influence on behaviour (Loewenstein et al., 2001). In sum, emotional reactions are viewed as important in all stages of the decision-making process. Consequently, it is important to account for both cognitive and emotional processes related to risk perception and related decision-making.

1.1.1. Main aims of the thesis

To achieve the aims of the thesis it was seen as necessary to separate the main goal into three more specific aims. The effect of risk perception on probability assessment and consequence evaluation have been discussed in numerous studies (e.g. Sjöberg, 1999; Slovic, 1987, 1992; Slovic, Fischhoff, & Lichtenstein, 1985). These studies have investigated many different risk sources. To gain more specific information, a questionnaire was designed to investigate risk perception in one specific area – transport. Probability assessment, consequence evaluation, and worry were three of several factors under scrutiny. Hence, the first aim of the thesis is to investigate the *perception of transport risk in the Norwegian public*.

When a risk source is perceived as risky, at least two possible actions may be undertaken, safety-seeking or risk-seeking. According to Thuen, Klepp, and Wold (1992) risk-seeking refers to behaviours that are deliberately engaged in for the pleasurable stimulation they yield, whereas safety-seeking refers to engagement in behaviours that aim at reducing the risk of mortality or injuries. It seems reasonable to assume that there is a negative relationship between actions that are directed towards experiences of risk (risk-seeking) and actions directed toward safety. Thuen et al. (1992) found that safety-seeking can be considered as a behaviour pattern separate from risk-seeking behaviour (e.g. adolescents engaging in risk-seeking behaviour may also use safety equipment, while those not engaging in risk-seeking behaviour do not necessarily use safety equipment). Traditionally, risk research has focused on the individuals who experience accidents and/or have the ‘wrong’ attitudes and behaviour. One ‘problem’ is that there are not sufficient numbers of accidents to allow valid and reliable assumptions (Adams, 1995). Hence, it is considered appropriate to investigate what characterizes those who think about safety and choose what they view as the safest alternative (when they have the opportunity). Prioritizing safety involves the fact that people choose the safest option when they have the opportunity. With increased knowledge concerning what influences safety priorities, one may gain the ability to influence people’s choices and hence increase safety. Hence, the second aim of the thesis is to investigate *determinants of priorities of safety in transport – personality, worrying about transport risks, driver optimism, negative attitudes towards traffic rules, and willingness to pay to increase safety*.

How people perceive and react to transportation risk is interesting for several reasons. First, it may affect demands for risk mitigation (the demand from the public towards the authorities to reduce the risk). Second, it is related to explaining why a potentially hazardous risk source is defined as a problem. Finally, it is related to policy demands. Both probability and consequences have been found to be important in studies carried out previously (e.g. Rundmo, 1994; Sjöberg, 1999; Slovic, 1987, 1999). In addition, several authors have found that affectivity have an important function in risk perception. However, there have been some problems in explaining demand for risk mitigation. One possible starting point is to use a well-known theory within risk perception – the risk-as-feelings hypothesis – to investigate whether it is possible to apply the same framework in regard to demand for risk mitigation. Hence, the third and final aim of the thesis is to investigate *the applicability of the risk-as-feelings framework to explain demand for risk mitigation*.

1.2. Main concepts

1.2.1. Transport risk

There are several reasons for focusing on transport risks as a field of study. The first is that knowledge about different kinds of risk varies between different people and over time. Thus, it is regarded as useful to investigate a common and well-known risk source and hence risks related to different means of transportation were chosen. Traditionally, transportation has been defined as the safe and efficient movement of people and goods (Waller, 1996), and the development of a safe and efficient transportation system has dominated the field. Transportation psychology (also referred to as mobility psychology), has its focus on mobility issues, individual and social factors in the movement of people and goods, and travel demand management (World Knowledge Library, 2007). Traffic psychology is defined as ‘the study of the behaviour of road users and the psychological processes underlying that behaviour’ (Rothengatter & Vaya, 1997, p. 223) as well as the relation between behaviour and accidents. Traffic psychology attempts to identify the determinants of road user behaviour with the aim of developing effective accident countermeasures. In spite of this effort, accidents continue to happen and it is generally estimated that approximately 90% of accidents can be attributed to human error (McKenna,

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1983). Consequently, there is a demand for more knowledge on the determinants of user behaviour.

The second reason for focusing on transport risk is that, as the world becomes more international most people travel more and use more means of transportation, more frequently. The number of passenger using different means of transportation in Norway increased from 1.316 million in 1965 to 4.657 million in 2006 (Statistics Norway, 2006b). Number of kilometres travelled per inhabitant per day has also grown, within aviation from 0.25 to 2.61, by railroad from 1.78 to 1.94; while travel at sea has stayed stable at 0.50, and car use has grown from 7.43 to 30.27 kilometres travelled per day. On this basis, it comes as no surprise that most fatalities occur on the road. It is a reality that for each serious or fatal accident avoided numerous people are spared from suffering and distress. In addition, the society as a whole avoids substantial expenses. Hence, understanding the process of risk perception related to transport is important to minimize the costs to humans and financially.

The third and final reason for focusing on transport risks is that contrary to many other risk sources, risk associated with different means of transportation may be regarded as more unambiguous. In general, the consequences are mostly known to both lay people and scientists, there are few delayed effects, the risk is (more or less) voluntary, there is little chronic potential (that we know of) because most accidents have an immediate and not a delayed effect, and most people have – to a certain extent – learned to live with the risk. Overall, most people are familiar with the potential risks associated with different means of transportation, and hence they do not feel they have to assess the danger associated with more or less unknown risk sources. Additionally, even though means of transportation may be fatal, this hardly has big consequences compared to a nuclear accident, for instance. Therefore, associated negative affect towards the risk source is believed to be lower and the impact of stigmatization less than for many other risk sources.

There are several differences between public and private transportation. The consequences of an accident differ in scope. A fatality within aviation and railroad will result in a higher number of deaths than a fatality within private transportation. Another important difference within transport is the difference in personal control. The initial choice of means of transportation is controlled by the individual, but when choosing a public means of transportation the degree of controllability decrease. Consequently, a difference in the perception of risk between public and private means of transportation due to accident frequency and personal control must be accounted for.

Of all means of transport, transport by road is the most dangerous and the most costly in terms of human lives, according to the Road Safety Action Programme (European Union, 2003). This problem has attracted much attention. A joint effort between the World Health Organization (WHO) and the World Bank, has resulted in a '*World Report on Road Traffic Injury Prevention*' (2004). The main reason behind this effort was that traffic injuries are a major, but often neglected, global health problem. In 2002, it was estimated that worldwide, 1.2 million people were killed in road crashes every year. Within the European Union there are approximately 1.3 million accidents on the roads every year, which cause more than 40,000 deaths and 1.7 million injuries. The direct and indirect costs have been estimated at 160 billion euro, i.e. 2% of the EU's Gross National Product (GNP). Compared to other, less frequent, but considerably more unusual types of tragedies, these figures attract less media attention. In the United States, violent death sustained from motor vehicle collisions was the most frequent cause (Stroebe & Stroebe, 1995).

Statistics Norway (SSB) reported that 18% of accidental deaths in 2004 were a result of transport-related accidents (only accidents from falling and suicides were more common) (Statistics Norway, 2004). Most of these accidents were related to car use. There have been approximately 3000 deaths per 10-year period; this rate has been stable since the 1970s. This means that the accident rate has decreased since the amount of driven kilometres has increased from 203 to 365 (an increase of almost 80 per cent). According to the SSB, the Norwegian police registered 11,214 accidents involving personal injuries in 2005 alone. Of these, 224 people were killed. In addition, depending on the danger, narrow escapes usually are not reported and therefore not included in the statistics. Therefore, finding measures to reduce accidents is important, and hopefully the results will contribute to this process.

Throughout history, different individuals have tried to understand both what should be considered as risky as well as the concept of risk. In addition, a substantial effort has been made to comprehend how people understand and judge different risk sources. This implies a difference between objective and subjective risk. It is thus essential to further discuss a joint understanding of the concept of risk and of risk perception.

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1.2.2. The concept of risk

Bernstein (1995) sums up the history of risk and its importance in the following manner:

From the superstitions of the ancients to the strict regulations of the early Christian church, from the rational views of the Renaissance and the Enlightenment to the upheavals provoked by World War I and the Great Depression, and from the classical concepts of modern portfolio theory to the dark and hidden forces driving us today, perceptions of risk are the most powerful symptoms of what a society is all about. (p. 11)

Risk is a multifarious phenomenon, and before a further discussion of risk perception is pursued, the word 'risk' needs an introduction. The literature abounds with different notions of risk and the origin of the word risk is disputed in the literature (Althaus, 2005). The British Medical Association (Althaus, 2005) suggested that the word derived from the Greek word *rhiza*, which refers to the 'hazards of sailing too near to the cliffs: contrary winds, turbulent downdraughts, swirling tides' (p. 570). Bernstein (1995), found that the word 'risk' has its roots in the early Italian *risicare*, or from the Greek *rhiza*, meaning to dare. The contemporary usage of the word is just as contested as its origin. The original meaning of the word has changed over time, and today it has a negative connotation in common English usage. It has changed from simply describing any unexpected outcome (good as well as bad) to relating to undesirable outcomes. According to Bernstein (1995), perception of risk has reflected the temper of the times in each society. Hence, these developments are to be expected.

From a more philosophical stance the ontology of risk refers to its metaphysical status as a property or quality in the physical world (Krimsky & Golding, 1992). Is the risk of something an objective measure of something particular, or a subjective value that varies according to context? Risk, though it has some roots in nature, is inevitably subject to social processes (Thompson & Wildavsky, 1982). Krimsky and Golding (1992) argue that the concept of risk helps people to interpret and cope with dangers and the uncertainties of life, including, but not limited to, the prospects of physical harm. Human minds and cultures shape the concept of risk. The term risk denotes the possibility that an undesirable state of reality (adverse effects) may occur as a result of natural events or human activities (Renn, 1992). The British Medical Association

suggested a simple definition of risk in 1990: 'Risk is the probability that something unpleasant will happen' (p. 14). Thus, the event is not certain to happen, but if it does occur, it will have a negative rather than positive effect. According to the most commonly found definition in the safety literature, risk is the probability of an adverse future event multiplied by its magnitude (Adams, 1995). Klinko and Renn (2002) defined risk as the possibility that human actions or events lead to consequences that harm aspects of things that human beings value. This definition implies that the severity of experiencing harm depends on the causal relationship between a stimulus and the consequences. If we take a non-fatalistic viewpoint, the consequences can be altered either by modifying the initiating activity/event or by mitigating the impacts.

As seen above, all risk concepts have one element in common, a distinction between reality and possibility. A discussion around possibility and uncertainty of a situation has prevailed and Rosa (2003, p. 56) defined risk as 'a situation or an event where something of human value (including humans themselves) is at stake and where the outcome is uncertain'. This definition of risk will be applied in this thesis.

The basic assumption in much of the psychological research on risk is that reality is inherently subjective and that different people experience risk differently. Slovic (2000) concluded that risk does not exist 'out there', independent of our minds and cultures waiting to be measured. Instead, human beings have invented the concept of risk to help them to understand and cope with the dangers and uncertainties of life. There is no such thing as 'real risk' or 'objective risk'. The term 'risk' alone creates an assumption about something that is out there and that humans do not experience the actual risk unless the result manifests itself. Hence, objective and subjective risk are seen as two different things, and a further elaboration of subjective risk is viewed as interesting. Subjective risk is how the individual perceives risk.

1.3. Risk perception

More knowledge on how people perceive and interpret risk may provide an important contribution to how individuals deal with risk, prioritize safety, and demand risk mitigation. Hence, how people perceive and interpret transport-related risk is important to the decisions they make as well as their behaviour. Since people are different and they react differently to different events, the challenge is to find what is shared amongst these individuals and draw some

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conclusions about the subjective reality of most people. Because risk is universal, transport-related risks are investigated in this thesis and several questions asked, including: Are there similarities in the way transport-related risks are perceived? Are some aspects of risk perception more dominant than other aspects? How important are emotional reactions to risk, compared to cognitive evaluation of the same risk source?

In scientific literature, risk perception is mentioned more often than risk construction. Constructing risk may be a more appropriate term than perceiving risk since risk cannot be perceived in the basic meaning of the word. Nevertheless, risk perception is the term used here because this is most common in risk research. Different individuals perceive risk differently. An objective risk is something else, and measured in a different manner. How risk is perceived will vary and there are different theories in the field of risk perception. Consequently, a presentation of how risk is perceived as well as relevant theories is needed.

Risk perception and risk-decision research has to a large extent been dominated by the psychometric paradigm for understanding how risk is perceived and judged (Slovic, 1987). Within the psychometric paradigm Finucane and Slovic have been among the key researchers (see e.g. Finucane, Alhakami, Slovic, & Johnson, 2000; Slovic, Finucane, Peters, & MacGregor, 2004; 2005). There are also many studies showing that there are substantial correlations between risk perception, risk concern, and protection behaviours (e.g. Kraus & Slovic, 1988; Rohrman, 1994; Slovic, 1987; Slovic et al., 1985; Weinstein & Nicolich, 1993). In addition, cultural theory, launched by Douglas (2001) and Douglas and Wildavsky (1982) has also been important in the discussion on risk perception and risk interpretations (Dake, 1991; Wildavsky & Dake, 1990). According to Wildavsky and Dake (1990) the cultural theory of risk has the capability to 'predict and explain what kind of people will perceive which potential hazards to be how dangerous' (p. 42). Cultural theory has been the basis of a large body of literature addressing risk perception, and interpretation and reinterpretation of risk. However, the empirical support for this theory has been surprisingly meagre and cultural theory has not been

capable of explaining an acceptable percentage of variance of risk judgement (Sjöberg, 1997). Risk is seen as 'culturally biased' and people perceive, interpret, and reinterpret various kinds of danger depending on their 'cultural bias'. This is supported by Weinstein (1989), who concluded that risk perception goes beyond the individual, and it is a social and cultural construct reflecting values, symbols, history, and ideology. Consequently, perceived risk

will benefit from being investigated in terms of specific risk sources in a similar population.

As seen from the previous section, risk has been defined in a number of ways. Wherever it is discussed, there seems to be consensus about the essence of risk as consisting of the probability of an adverse event and the magnitude of its consequences. This definition may be adequate to define the risk of engineering-type calculations, but Rayner and Cantor (1987) found it quite misleading at the broader, more intractable level of large-scale societal risk management. This is because risk perception is more than merely an objective assessment of probability and consequence; it refers to an individual's intuitive judgement guided by emotional and affective processes. Hence, affectivity is permanently bound to risk perception, and the impact of affective processes on risk perception has become more acknowledged in recent years (Kobbeltvedt, Brun, Johansen, & Eid, 2005). Whether it is a part of the perception process, or something that may be separated from this process is a matter of discussion. Zajonc (1980) discussed what came first and concluded that affect and cognition are under the control of separate and partially independent systems that can influence each other in a variety of ways. Furthermore, he says that they 'constitute independent sources of effects in information processing' (p. 151). Hence, emotions and affect towards different risk sources cannot be ignored.

1.3.1. Affect and worry

Sjöberg (2004) argued that words such as affect, emotion and feeling are not especially well defined and have ambiguous relations to each other. Hence, this distinction needs attention. First, it is necessary to clarify the difference between cognition and affect. Cognition is the act or process of knowing, including both awareness and judgement. According to Fiske and Taylor (1991) research on affect has generated many theories, and is hard to manoeuvre through. Affect is a broad term, including a whole range of preferences, evaluations, moods, and emotions (Fiske & Taylor, 1991). Slovic et al. (2005) argued that affect is a 'faint whisper of emotion' (p. 35). This implies a consultation of an evaluative affective pool when judging risk because people draw on global evaluative feelings of liking and disliking that lie inherent in the perceptual input (Kobbeltvedt et al., 2005). Furthermore, Slovic et al. (2005) argued that affect means the specific quality of goodness or badness which is both experienced as a feeling state and demarcating a positive or negative quality of a stimulus. An

example by Slovic et al. (2005) illustrates this: certain words will release associated feelings such as the words *treasure* or *hate*. Slovic et al. (2005) call reliance on these feelings the ‘affect heuristic’.

Emotion is a rich variety of affective states, a complex assortment of affects, which may be intense and short-termed (Fiske & Taylor, 1991). Emotions are about a personally meaningful circumstance (i.e. they have an object) (Fredrickson & Joiner, 2002). Feelings were defined by the Merriam-Webster online dictionary (2006a) to be a synonym of emotion, and the affective aspects of consciousness. Nathanson (1992) summarized the relation of the three words in the following manner: ‘Affect is biology, feeling is psychology and emotion is biography’ (p. 50).

According to Parrott (2001), emotion can be separated into primary, secondary, and tertiary emotion. Worry is categorized as a tertiary emotion alongside anxiety, nervousness, tenseness, uneasiness, apprehension, distress, and dread. The primary emotion in this category was fear, and the secondary emotion was nervousness. It can be argued that fear is a basic emotion and will therefore precede risk perception, whereas worry is a tertiary emotion which may also depend on cognitive processes. Consequently, if this differentiation is not properly accounted for, ambiguous results may occur. Researchers within judgement and decision-making have defined worry as thoughts about uncertain events with unwanted consequences (MacGregor, 1991). It is also seen as a ‘postbehavioral affective reaction’ (van der Pligt, Zeelenberg, van Dijk, de Vries, & Richard, 1998, p. 33). Hence, elements of both cognition and affect are also represented in the term worry, and here it is seen as the affective aspect of consciousness.

In sum, potential hazards may cause worry and concern, and consequently, affective aspects are involved in risk perception. Risk perception is seen as the subjective assessment of the probability of a specified type of accident happening, how concerned we are with the consequences, and how much worry we feel when thinking about this. This means that worry is seen as a separate part of the risk-perception process. Hence, the first aim of the thesis is to investigate the perception of transport risk in the Norwegian public.

When investigating perceptions of risk a differentiation between personal risk and general risk is necessary because the vast majority of people perceive their chances of a negative event as less than average. McKenna (1993) alleged that it is not so much that individuals believe negative events will not happen, but rather that such events are assessed as relatively unlikely to happen to them. Weinstein (1982) labelled this unrealistic optimism, in regard to not

experiencing an injury (some of them may be correct, while others are mistaken). Consequently, separating risk sources into personal versus general risk, as well as private means of transportation versus public means of transportation was seen as necessary. Compared to general risk, the perception of personal risk was expected to be lower.

Furthermore, findings where females assess risk higher than males have been reported in numerous studies (e.g. Boholm, 1998; Byrnes, Miller, & Schafer, 1999; D. J. Davidson & Freudenburg, 1996; DeJoy, 1992; Flynn, Slovic, & Mertz, 1994; Glendon, Dorn, Davis, Matthews, & Taylor, 1996; P. Gustafson, 1998; Shapiro, Siegel, Scovill, & Hays, 1998). Therefore, an investigation of the effect of gender on risk perception should be accounted for and discussed. Furthermore, even though studies have found these differences, the underlying reason for the differences needs further scrutiny.

When the risk associated with a potential hazard is perceived as too high different choices are available to the individual. One of these choices is the intention to choose the safest alternative. This is seen as an intention to prioritize safety.

1.4. Determinants of safety priorities

To gain a further understanding of the decision-making process it was seen necessary to investigate the result of this decision-making process. When an individual is faced with risk, two possible actions may be undertaken, risk-seeking and safety-seeking. Traditionally, risk-seeking has been in focus. Here, safety-seeking will be investigated. To engage in safe behaviour is a choice the individual has to make. Behind this choice lies an intention about future behaviour and this is seen as the choice to prioritize safety. Prioritizing safety is a part of a decision-making process, and applies to both public and private transportation. Several factors may influence the priorities of safety, including personality, worry related to the risk object, driver optimism, and negative attitudes towards rules.

1.4.1. Personality

Personal characteristics will influence how people act and react to risk. Personality constitutes the individual's characteristic patterns of behaviour,

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thoughts, and feelings (Carver & Scheier, 2000). Hence, personality should be predictive of a wide variety of behavioural tendencies, including decisions concerning safety. However, different individuals have different interpretations of risk and therefore different behaviour. One explanation may be that personality is constituted of different parts, each of which may influence risk perception differently. Based on relevant literature (e.g. Beirness, 1993; Oltedal & Rundmo, 2006; Ulleberg & Rundmo, 2003), three personality measures were adopted and used in the study – trust, excitement-seeking, and anxiety. Trait anxiety is found to be a central component of neuroticism (Spielberger, Gorsuch, & Lushene, 1970), and this trait consistently shows significant associations with somatic or health complaints (Robbins, Spence, & Clark, 1991; Smith, Pope, Rhodewalt, & Poulton, 1989). Anxiety is related to how much worry a person feels concerning different objects and situations, and will therefore have an effect on worry. Excitement-seeking is something very different from worry. Excitement-seeking is connected to voluntary risk taking and may influence how a potential risk source is evaluated. In addition to excitement-seeking and neuroticism, trust is important in different respects. According to Frewer, Howard, Hedderley and Shepherd (1998), trust is likely to be a major determinant of peoples' reactions to potential hazards, and was found to be important for those responsible for risk regulation, as well as individuals' reactions to risk information. According to Slovic (1993), trust is fragile but also one of the most fundamental qualities:

In recent years there have been numerous articles and surveys pointing out the importance of trust in risk management and documenting the extreme distrust we now have in many of the individuals, industries, and institutions responsible for risk management. The pervasive distrust has also been shown to be strongly linked to risk perception and to political activism to reduce risk. (Slovic, 1993, p. 675)

Hence, personality was viewed as an important factor when it came to risk perception. Excitement-seeking was thought to have a direct effect on attitudes towards traffic rules, and a negative effect on priority for safety. This is because those high on excitement seeking were viewed as less likely to take preventive action, and therefore to score lower on priority of safety. Anxiety was hypothesized to have a direct effect on worry as well as whether the person was optimistic concerning driving a car.

Personality was believed to influence the degree of worry related to thinking about the possible effects of an accident. Anxiety was hypothesized to have a positive effect (i.e. anxious individuals experience more worry), whereas excitement-seeking was hypothesized to have a negative effect (i.e. individuals scoring high on excitement-seeking experience less worry). The opposite of worrying about transport risk was to be optimistic about future outcomes (i.e. not experience accidents).

1.4.2. Driver optimism

Many studies have found people to rate themselves and others differently (e.g. Brosius & Engel, 1996; Clarke, Lovegrove, Williams, & Machperson, 2000; Klonowicz, 2002; Mahatane & Johnston, 1989; McKenna, 1993; McKenna & Albery, 2001; Taylor & Brown, 1998; Weinstein, 1980). One reason why people fail to prioritize health protective actions is the pervasive tendency to underestimate their own health risks compared with those of others (Weinstein, 1987). This is seen as a dispositional optimism and can be defined as having a generalized positive expectancy about the future (McGregor et al., 2004). Dispositional optimism has been argued to be a personality trait by some authors (Carver & Scheier, 2002), and specific for the different situations a person may find themselves in by others (Schulman, Keith, & Seligman, 1993). Here, optimism is related to traffic behaviour and not regarded as a personality trait. When people perceive themselves as less likely to experience something negative compared to the average person, they are more likely to engage in risk behaviour (Moen & Rundmo, 2005).

According to Deery, Kowadlo, Westphal-Wedding, and Fildes (1998) classification of perceived risk in traffic consists of several aspects. The first concerns the individuals' perception of their driving skills. Driving skill concerns the limits of performance in a driving task and it is expected to improve to a certain level with practice. Driving skills are concerned with the decision-making aspects of driving, that is, the manner in which people choose to drive or the driving habits that have developed over time. The second is driving style, which concerns the way individuals choose to drive, and this is expected to be influenced by attitudes and beliefs relating to driving, as well as needs and values that are more general. The third is ability, which is the potential skill that a person can acquire; and the fourth is personality. The sum of an individual's personal characteristics that put him or her at greater risk of

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involvement in road-traffic crashes, other things being equal, is called crash liability (Elander, West, & French, 1993). Both personality and perceived skill will be related to priorities of safety in the following.

In sum, optimism has been investigated in several studies and different causes of optimism have been investigated. The worry people report when thinking about experiencing an injury themselves and how worried they are about others are viewed to be relevant. Optimism has been found to be inversely associated with distress. However, according to McGregor et al. (2004), less is known about the mechanisms underlying this relationship. Risk assessment of both self and others as well as controllability of the risk has been found to be important (Higgins, St Amand, & Poole, 1997) and people rate a risk as lower when they think they have control over the outcome. As a result, optimism is included because it is believed that it will affect priority of safety. For drivers, optimism is a factor that makes a person take chances (Dejoy, 1989; van der Pligt, 1996), while driver stress has the opposite effect (Iversen, 2004a). Consequently, it was hypothesized that those who scored high on driver self-assessment (compared to others) and driver confidence, in addition to scoring low on driver stress, were in general more optimistic than those scoring lower on the first two factors and higher on driver stress. Driver optimism was hypothesized to have an effect on priority of safety. However, optimistic people may be expected to have a desire to protect their optimism, and accordingly, to take safety measures. Consequently, whether driver optimism has a positive or negative effect on priority of safety was considered unclear, and hence no hypothesis about this relationship was put forth prior to the study.

When a potential risk source is discovered, both positive and negative aspects of the risk may be evaluated. Hence, the risk may be looked upon with a certain degree of favour or disfavour. This constitutes either positive or negative attitudes towards the risk.

1.4.3. Negative attitudes towards rules

How risk is interpreted and perceived may have different outcomes, and one of these is the intention to do something to reduce the risk. Underlying intentions are attitudes and subjective norms (Armitage & Conner, 1999). Attitudes can be defined as a tendency to evaluate a particular 'attitude object' with some degree of favour or disfavour (Eagly & Chaiken, 1993). According to Stroebe and

Stroebe (1995), social psychologists typically divide the evaluative tendencies that reflect an attitude into three classes: cognitive reactions, affective reactions, and behaviour. According to the theory of planned behaviour (1980; 2005), specific behaviours are guided largely by a reasoned action approach that assumes that the chosen behaviour follows reasonably from peoples' beliefs, attitudes, and intentions. Hence, negative attitudes towards traffic rules are regarded as a possible negative influence on safety priorities and should be accounted for.

1.4.4. Willingness to pay to reduce risk

As society has changed in the last part of the 20th century risks became more globalized, less identifiable and more serious in their effects, and therefore less easily manageable and more anxiety-provoking (Beck, 1992). One way of dealing with this is to pay for risk reduction. Willingness to pay for a future risk reduction is less than willingness to pay for an immediate risk reduction of the same size (Alberini, Cropper, Krupnick, & Simon, 2004). Fischer et al. (1991) found that peoples' expressed willingness to pay for future risk reductions were greater for risks that presented a direct personal threat than for risks that posed a diffuse threat to the environment or to people in general. Willingness to pay for risk reduction was hypothesized to be positively related to safety priority.

Personality, worrying about risk, driver optimism, negative attitudes towards safety rules, and willingness to pay to reduce safety are all viewed as possible determinants of safety priorities and consequently, the second aim of the thesis is to investigate traffic safety by looking at five determinants of safety priorities. Anxious individuals were hypothesized to experience more worry and to be less optimistic compared to excitement-seekers. Excitement-seeking is also thought to have an effect on attitude because individuals who consciously seek risk are viewed as more likely to have a different attitude towards risk taking than individuals who do not seek out risk. Individuals who display negative attitudes towards traffic rules are hypothesized to have lower priorities of safety, whereas the effect of driver optimism is considered ambiguous.

To gain knowledge about what makes people perform safely is also an important topic for policy makers. It is interesting because it may affect demands for risk mitigation (i.e. the demand from the public to reduce the risk. See section 1.5.1 for further details). It is related to explaining why a potentially hazardous risk source is defined as a problem, and what actions are taken to

avoid this problem, as well as to policy demands. The next sections will first relate risk perception to feelings; thereafter demand for risk mitigation will be viewed in the light of the risk-as-feelings framework.

1.5. Risk-as-feelings

Different theories have addressed the interplay of cognition and affect. Some emphasize the cognitive appraisals underlying emotional reactions, e.g. the appraisal theories of emotions (Roseman, Antoniou, & Jose, 1996). Others account for how a person's affective state influences his or her processing style and evaluative judgements, e.g. the cognitive processing theories (Schwarz, 2000). Therefore, the question remains, if the assumption that probability assessment, consequence evaluation, and worry are all important for risk perception, what comes first? Common knowledge suggests that our judgment and behaviour in any given situation is affected by how we feel in that situation. It is assumed that judgment and behaviour cannot be seen as entirely different elements. Hence, it is expected that there is a connection between affectivity and cognition. Cognition may function solely if the risk does not affect us; however, we all read about accidents in newspapers and hear about them in different news media, see pictures, and know someone that has experienced the effect of the danger (i.e. it has been some kind of accident involving different means of transportation). Consequently, it is predicted that one cannot evaluate a risk source cognitively without some sort of affective response. Affect is a generic term for a whole range of preferences, evaluations or emotions (Fiske & Taylor, 1991). If it is assumed that people are fairly rational beings, cognition and affective responses will both occur, and the question is which is most important when evaluating a potential risk source.

Within research on risk perception the risk-as-feelings hypothesis highlights the role of affect (Loewenstein et al., 2001). According to the risk-as-feelings hypothesis, emotional reactions from risky situations have been found to be different than the cognitive assessments of those risks (Loewenstein et al., 2001). Peoples' cognitive assessment of risk depends on objective features of the risky situation, such as probabilities of outcomes and assessments of outcome severity. In contrast, people's emotional reaction to risk depends on a variety of factors – such as vividness of the imagined consequences, personal exposure to outcome, and their history of conditioning. It seems as if the emotional reaction, not the cognitive assessment, drives behaviour when this divergence occurs.

Hence, emotions often produce behavioural responses that differ from what the individual views as the best course of action. It is also found that feelings of risk are largely insensitive to changes in probability, whereas cognitive evaluations do consider probability. Loewenstein et al. (2001) postulated that ‘response to risky situations (including decision-making) results in part from direct (i.e. not cortically mediated) emotional influences, including feelings such as worry, fear, dread, or anxiety’ (p. 272). The risk-as-feelings hypothesis is primarily based on the role of affect when the decision-making occurs. Affectivity related to the activity or event is argued to be an element of risk perception. When the cognitive evaluation of a risk source is uncertain, people may have to rely on the affective responses they have in regard to the risk source.

The risk-as-feelings hypothesis (Loewenstein et al., 2001) postulated that responses to risky situations result in part from direct emotional influences, including feelings such as worry, fear, dread, or anxiety. Emotional reactions to risky situations often diverge from cognitive assessments of those risks. When such divergence occurs, emotional reactions drive behaviour. According to Loewenstein et al. (2001), decision-making under risk and uncertainty has been one of the most active and interdisciplinary research topics in judgment and decision-making. When a potential threat is judged as too high, decisions have to be made, and an individual may start to take actions to reduce the risk source. The most commonly used concept for this process is risk mitigation. The risk-as-feelings hypothesis provides a framework which includes both behaviour and outcomes (including emotions) and it was found relevant to investigate whether a possible application of the risk-as-feelings hypothesis was to use it as a framework to explain demand risk mitigation.

1.5.1. Risk mitigation

Mitigation derives from the word mitigate, which means to make less severe, violent, or painful. According to the Merriam-Webster dictionary (2006b), mitigation is to act in such a way as to cause an offence to seem less serious. It is also defined as a partial excuse to mitigate censure, in an attempt to represent an offence as less serious than it appears by showing mitigating circumstances. According to this definition, the actual reduction of a danger does not seem as important as the image of less danger. Within biology (Hyperdictionary, 2005), mitigation includes any one or more of the following approaches, with an emphasis on attempting these measures in the sequence in which they are listed:

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(1) avoiding the impact altogether by not taking a certain action or part of an action; (2) minimizing impacts by limiting the degree or magnitude of the action and its implementation; (3) rectifying the impact by repairing, rehabilitating, or restoring the impacted environment; (4) reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and (5) compensating for the impact by replacing or providing substitute resources or environments. The term mitigation is sometimes used interchangeably with ‘compensation’ which strictly speaking means ‘replacement’. The biological meaning of the word seems to be the one used in the area of risk mitigation research in psychology. Here, risk mitigation is seen as the steps policy makers, experts, or the individual take to reduce a risk source. Demand for risk mitigation is the demand from the public directed towards the authorities or government to reduce a specific risk source.

Affectivity may influence mitigation demands, and more work is needed to capture the interplay of affect and cognition on risk mitigation. Most models build on the probability versus consequence perspective in some way or the other, but the affect dimension is often missing. More recent research by Slovic et al. (2005) have accounted for this and talk about the affect heuristic. It is known that uncertainty is important and therefore the affective reaction to uncertainty. The expectancy value models do not consider these feelings, and therefore may be lacking an important dimension.

According to Sjöberg (2006), feeling is a broader and more complex term than emotion, and one possible meaning is that affection applies to feelings that are also inclinations or likings. Hence, one of many specialized meanings of affect is feelings of liking, found also in contemporary writings on the psychology of emotions (Ekman & Davidson, 1994). Liking is related to the quality associated with the risk source and therefore a component in feelings. The goodness or badness associated with places, products, technologies, or people can evolve to negative imagery and result in stigmatization. When something is stigmatized it makes it easier for people to know that it is a negative ‘thing’ and the negative information is more easily accessed (and the object is avoided). Consequently, three variables were included in the term ‘feelings’: the worry the person felt when thinking about the risk, how much they were thinking about it, and the negative inclination associated with the risk (labelled stigma).

Few, if any, have investigated whether it is possible to use the risk-as-feelings framework to predict mitigation demands. Therefore, it is interesting to investigate whether behavioural intention about prioritizing of safety could be

used as a main determinant of demand for risk mitigation and how much of the demand could be explained by this model. In addition, feelings and general risk assessment (cognitive) was expected to have an impact on mitigation demands. Hence, the third and final aim of the thesis is to examine the applicability of the risk-as-feelings hypothesis as a framework to explain demand for risk mitigation.

1.6. Specific aims of the thesis

The importance of a correct and thorough understanding of risk perception cannot be underestimated. This is a challenging task because different individuals perceive risk differently due to cultural differences, age groups, gender, and experiences. Different risk sources will also have an effect on risk perception. Hence, exploring how a general sample of the Norwegian public regarded transportation risks when they were asked about the probability, consequence and worry related to risk sources was viewed as important. Hence, the aims of Paper I are to:

- Examine the perception of transport risk in the Norwegian public.
- Analyse the dimensionality of risk assessments, and test the reliability of the factor structure of public and private transportation.
- Investigate probability assessment, consequence evaluation, and worry as predictors of risk perception.
- Further investigate differences in risk perception due to gender.

The choice to engage in either safe or risky behaviour is taken by different individuals. To know what is important to priorities of safety can give crucial information to both attitude campaigns and risk communication. Accordingly, the aims of Paper II are to:

- Examine five determinants of priority of safety; personality, worry, driver optimism, negative attitudes towards traffic rules, and willingness to pay.
- Analyse the dimensionality of the five determinants of priority of safety, and test the reliability of the factor structure.
- Investigate a proposed model for the relationship between the five determinants and safety priorities.

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There has been controversy over the role played by affect in risk perception. In addition, demand for risk mitigation and identifying its major predictor have been discussed. Sjöberg (1999) has argued that probability is most important to risk perception, whereas consequences are most important to demand for risk mitigation. The risk-as-feelings perspective has included the role of feelings in its model, and it is argued here that this framework can also be used to explain demand for risk mitigation because intentions are equated with priorities towards safety. Therefore, the aims of Paper III are to:

- Examine the risk assessments related to private transportation.
- Analyse the applicability of the risk-as-feelings framework to explain demand for risk mitigation.
- Investigate the additional effect of age, gender, education, and exposure to risk.

2. Method

2.1. Sample

A questionnaire survey was carried out on a representative sample of the Norwegian public. The sample was drawn by computer from the national registration office (Folkeregisteret) and 4832 questionnaires were distributed in the spring of 2004 to respondents aged between 18 and 65. 1730 questionnaires were returned. This gave a response rate of 37 per cent. The sample was representative of the Norwegian public with regard to gender, age, and education (Table 1). The average age of the respondents was 43 years. In total, 43 per cent were educated at a college or university, and 47 per cent had a work-related or senior high school degree. The remaining 10 per cent had junior high school education. A total of 51.8 per cent of the respondents were women. Furthermore, 25 per cent of the respondents lived in the four largest cities in the country, and this reflects the actual distribution of the population.

A follow-up questionnaire was distributed in the autumn of 2004. Of the 990 questionnaires distributed in the follow up, 510 were returned – an overall response rate of 52 per cent. The analyses showed that the distribution of respondents was close to the distribution of the population. The sample consisted of 49 per cent men and 51 per cent women. According to SSB, the actual distribution in Norway in this age group is 50.4 and 49.6 per cent respectively. The respondents' mean age was 41.73, and mean in the Norwegian public for people aged between 18 and 65 is between 40 and 41. The level of education was found to be higher than in the population: 47% of the respondents reported having completed practical or high school education compared to 43.4 in the Norwegian population as a whole. The difference between the populations was even higher when looking at the actual distribution in the public: 43% of the respondents reported a university degree compared to 25.4% in the Norwegian population as a whole.

Table 1.
Gender, Age, Education, and Exposure to harm

	Mean Questionnaire 1	Mean Questionnaire 2	Actual distribution
Females	51.8%	52.8%	51%
Age	42.73 (13.08)	42.42 (12.75)	40.5
Education*	2.93 (1.06)	2.96 (1.07)	
Exposure to harm**	2.50 (1.13)	2.56 (1.17)	

* 1 = junior high school (10%), 2 = practical education (30.2%), 3 = high school (16.8%), 4 = university degree (43%)

** 5-point scale of Likert type ranging from 1 = never to 5 = all the time

The survey was conducted with funding from the Research Council of Norway's RISIT programme (Risiko og Sikkerhet i Transportsektoren). The programme is running for the period 2003–2009. The goal of the programme is to generate knowledge that may provide a better understanding of transport risk and a better foundation for risk management within transport.

2.2. Measures

The measures in the three papers originated from two questionnaires. Paper I and II are based on both surveys, whereas paper III is based solely on the second survey. A short description of the measurements is given here. To ensure relevant questions, previous studies (e.g. Beirness, 1993; Iversen, 2004a; Sjöberg, 1999; Slovic, 2000; Ulleberg & Rundmo, 2003) were investigated before selecting and constructing measurements. Information from SSB was used as a source to find the most common means of transportation. To measure aspects related to transport risks, eight measurements were used. Ten means of transportation were chosen: plane, train, bus, ferry, boat, car, motorcycle, scooter, bicycle, and walking (being a pedestrian).

Rating scales: The following questions were asked to be assessed in regard to the different means of transportation:

1. Probability assessment: (a) How likely do you think it is that a person living in Norway will experience an injury when using the following means of

- transportation? (b) How likely do you think it is that you will experience an injury when using the following means of transportation? (1 = very likely; 7 = very unlikely).
2. Consequence: (a) If there is an accident, how likely do you think it is that someone will die (fatality)? (2). If you experience an accident, how extensive do you think the consequences will be? (1 = certain to be fatal; 7 = certain not to be fatal).
 3. Worry: (a) How worried are you when you think about the risk or probability of experiencing an I accident involving personal injury related to the usage of different means of transportation? (b) How worried are you when you think about the risk or probability that *you* will experience an accident with personal injury when using these means of transportation? (1 = very worried; 7 = very little worry).
 4. General risk assessment: How high do you assess the risk of using these means of transportation to be? (1 = extremely high; 7 = extremely small).
 5. Think about risk: When you use the following means of transportation, do you think about what might happen if an accident occurs? (1 = Yes, all the time; 7 = No, never).
 6. Safety priorities: When you choose the following means of transportation, how high do you prioritize safety? (1 = very high; 7 = very low).
 7. Stigmatization: Do you think there is something negative associated with using the following means of transportation? (1 = very negative; 7 = not at all negative).
 8. Demand for risk mitigation: How important is it for you that the risk of using these means of transportation is reduced? (1 = very important; 7 = not important at all).

The numbers were recoded in the presentations of the results, where 1 indicates low assessment and 7 indicates high assessment.

Personality measures: After reviewing relevant literature (e.g. Beirness, 1993; Oltedal & Rundmo, 2006; Ulleberg & Rundmo, 2003), three personality measures were adopted and used in the study – trust, excitement-seeking, and anxiety. The chosen instrument to measure personality was the Revised Neo Personality Inventory (Costa & McCrea, 1992), where personality was measured through a number of assertions that individuals made decisions about; 24 items measured the three traits. All items were scored on five-point Likert scales ranging from ‘strongly disagree’ to ‘strongly agree’ (to see the questions look at

Costa & McCrea, 1992). Subsequently, different personalities were identified based on how individuals agreed or disagreed on these assertions.

Other measures: Several measures were adopted or constructed to measure driver optimism, worrying about transport risks, willingness to pay to increase safety, and negative attitudes toward traffic rules (as a driver). All measurements used a seven-point evaluation scale of Likert type, ranging from 1 = highly disagree to 7 = highly agree.

Three dimensions were adopted from Iversen (2004a) to measure driver optimism, driver self-assessment, driver self-confidence, and driver stress. Low scores indicated that the respondents viewed their ability and confidence as low, and low scores on driver stress indicated little driver stress. The following 8 items were intended to measure driver self-assessment: (1) I am a good driver compared to someone my age and with similar experience; (2) I am a good driver compared to someone with of same gender and with similar experience; (3) I am a good driver compared to other family members; (4) I am a good driver compared to others in general; (5) I am competent to evaluate the proper action in a complex situation; (6) I feel safe in my role as a driver; (7) Since I am a good driver it is acceptable to speed a little; (8) I never lose control of the vehicle.

A total of 8 items were intended to measure driver self-confidence: (1) If I should become involved in an accident it will most likely not be my fault; (2) I know exactly how fast I can drive and still drive safely; (3) I never regret the decisions I make in traffic; (4) I am always certain of the proper behaviour in traffic; (5) I always keep calm and rational in traffic situation; (6) I always know what to do if difficult situations occur in traffic; (7) My driving skills are not good enough (Reversed); and (8) When I compare myself with other drivers I realize that I have a lot to learn (Reversed).

Driver stress was measured by the following 5 items: (1) As a driver I feel under constant pressure when I am in different traffic situations; (2) I often feel pressured to make decisions without thinking them through; (3) Situations where I am not in control happen often; (4) Situations where I am not sufficiently acquainted with the traffic rules happen often; (5) Disturbances often result in a loss of concentration in my driving.

In addition, 9 items were use to measure negative attitudes towards rules (Iversen, 2004b). The respondents were asked to assess the following items: (1) Many safety rules must be ignored to ensure traffic flow; (2) Sometimes it is necessary to bend the rules to ensure traffic flow; (3) Those who take chances and break the traffic rules are not necessarily less secure than those doing

everything by the book; (4) It is acceptable to speed when other people are not involved; (5) It is acceptable to take chances when you are the only one exposed to the risk; (6) Safety rules are often too complicated to be carried out in real life; (7) It is acceptable to break safety rules during transport of humans; (8) It is acceptable to break safety rules during transport of goods; (9) It is more important to contribute to passable conditions than to always obey the laws.

Worry was measured by 4 items adopted from Iversen (2004a): (1) I become nauseated when I think about accidents; (2) When there are a lot of accidents in transport, I become worried; (3) When I read about accidents within transport it effects my choice of transportation; (4) I think a lot about the unforeseen events that may occur when I use different means of transportation.

Two new measurements were developed specifically for the study. The first included a total of 7 items intended to measure the respondents' willingness to pay to reduce risk: (1) I am willing to pay more taxes to have safer roads; (2) I think toll roads are acceptable if the money is earmarked for expansion of the road network; (3) More expensive train tickets are acceptable if the result is safer journeys; (4) The safety within transport should be strengthened even though this may result in higher ticket prices; (5) The safety on the roads should be strengthened even though this results in increased expenses for road users; (6) It is important for campaigns to be directed towards those in the danger zone, even if it results in higher taxes; (7) The emergency services preparedness should be improved even though this would result in higher costs.

In the second scale intended to measure the respondents' priority of safety in transport, the following 9 items were used: (1) When I choose a means of transportation I prioritize safety above all else; (2) I don't want to risk my life and health by using an unsafe means of transportation; (3) It is my responsibility as well to say something when I see something unsafe; (4) If safety regulations are violated when I use public means of transportation such as buses or trains, I will exit at the first possibility; (5) I always say something when others break safety rules and regulations; (6) I follow safety rules when I use any means of transportation; (7) It is important to emphasize safety; (8) I understand the safety rules within transport; (9) To choose a safe mean of transportation is important to me.

Background variables: The demographic variables included age, gender, education, exposure to harm (1 = all the time, 5 = never) and whether the respondents had a driving licence.

2.3. Statistical methods

Risk perception was operationally defined as the level of risk that respondents perceive and report on rating scales of risk. Descriptive statistics gave information about gender, age, and education. Different statistical methods were applied in the three papers. Most of them refer to statistical significance, but one potential problem with this is that statistical significance is easy to obtain. All it takes, even with very minuscule effects and correlations, is a moderately sized sample. Hence, supplementary analyses were conducted to estimate the fit of different models. A short presentation of the methods used in the three papers is given in the following.

Exploratory factor analysis: Measures will be more reliable and valid if one computes separate variables to an index. To achieve this, explorative factor analysis was applied to identify underlying variables, or factors, that explained the pattern of correlations within the set of observed variables. Thereafter, the great number of single items was replaced by indices (i.e. risk perception, personality, attitude, and optimism). A further advantage is that this method simplifies the analysis and the presentation of the data. All data were quantitative at an interval level.

Measures of internal consistency: Cronbach's Alpha was applied as a model of internal consistency. It is probably the most commonly used statistic for estimating a test's reliability (Coolican, 1999), and the results are based on the average inter-item correlation, which depends on how the respondents vary on individual items. Nunnally (1978) recommended alpha coefficients equal to or higher than 0.70 be used to assess whether a given set of items are used to make up a scale.

Regression analysis: Multiple regression analyses were applied in order to examine the relationship between a specified set of predictors and a dependent variable. The results of the analyses are reported in Paper I, II and III by use of standardized regression coefficient (Beta values), adjusted R^2 and t-value. Evidently, it cannot be expected that any single factor will be capable of contributing as much as 100 per cent of total risk assessment (Marek, 1985). Neither is it to be expected that all the factors considered in a study will yield a 100 per cent contribution. All that can be expected is that if the contributing factors are relevant, their total contributions should be substantial. This is the case for most of the analyses. The standard limit for including and excluding variables in SPSS was used.

Structural equation modelling: Structural equation modelling (SEM) analyses were used in Papers II and III. Path analysis is an extension of the regression model, and was used to test the fit of the correlation matrix against two or more causal models being compared by the researcher. Path analysis was invented by the geneticist Sewall Wright (1917, 1934) (referred to in Gustafson & Stahl, 2000) as a technique to investigate the amount of influence exerted by one variable on another in a non-experimental situation. Path diagrams that pictorially represent the structural model are used to present the results. In the diagram, measured variables are designated by a box and latent variables, including disturbances, are represented by circles. In the path analysis, it is distinguished between exogenous and endogenous variables. The exogenous variables in the path model are those with no explicit causes (also called predictor variables, with no arrows going to them, other than the measurement error term). Endogenous variables (criterion variables) are those that do have incoming arrows. Endogenous variables included intervening causal variables and dependents. Intervening endogenous variables (mediating variables) have both incoming and outgoing causal arrows in the path diagram, whereas the dependent variables have only incoming arrows. The path models presented in Papers II and III have both exogenous, intervening endogenous variables, and endogenous variables. Covariances between exogenous variables and between disturbances are represented by curved lines with arrowheads at both ends. Paths are represented by straight lines with an arrowhead pointing toward the effect variable. The higher the path coefficient, the stronger is the effect that a certain variable has on another variable. Path coefficients vary from -1 to $+1$, and they are analogous to standardized partial regression coefficients. Thus, when a model has two or more causal variables, path coefficients are partial regression coefficients that measure the extent of the effect one variable has on another in the path model controlling for other prior variables. The calculation uses standardized data or a correlation matrix as input.

In Paper II a structural model with latent variables was applied. This may be seen as an extension of the path model because it represents a mix of a path analysis and a confirmatory factor analysis and has two parts: a measurement model and a structural model. In essence, the measurement model was first estimated and the covariance matrix between factors served as input to estimate the structural coefficients between constructs or latent variables.

The STREAMS 3.0 program was applied to estimate the structural equation models presented in Papers II and III (Gustafson & Stahl, 2000). The covariance matrix of the observed models was applied as a basis for the analyses

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in both papers. Several advantages of using the SEM models instead of e.g. multiple regression analysis or exploratory factor analysis are evident. Confirmatory factor analysis, ordinary path models, and full SEM models were investigated with the STREAMS program. How well the model fits the data can be ascertained by the researcher when SEM analyses are used. Another advantage is that the magnitude of the direct and indirect effects can be compared. In addition, measurement errors in the latent variables of the model are eliminated in SEM models.

Fit refers to the ability of a model to reproduce the data. Various fit indices may be used to estimate the fit of the data and some of them were used in the thesis and will be described briefly in the following. The chi-square (χ^2) statistics are commonly used in SEM analyses and represent the discrepancy between the observed and the reproduced covariance matrix. Hence, the χ^2 represents the fit between the data and the hypothesized model. For relatively moderate models with approximately 75 to 200 cases, the χ^2 is a reasonable measure of fit. However, for models with more cases, the chi square is usually statistically significant. χ^2 is also affected by the size of the correlations in the model: the larger the correlations, the poorer the fit. For these reasons, alternative measures of fit have been developed and they are used here since there are more than 200 cases. Hoelter's critical N (CN) is the extent to which the sample size must reach for the researcher to accept the model by chi-square, at the 0.05 or 0.01 levels. CN should be greater than 200. This throws light on the chi-square fit index's sample size problem.

In addition, several other fit indices were used to test the models. The Root Mean Square Error of Approximation (RMSEA) measure is based on the non-centrality parameter, and is one of the most applied and highly recommended measures of model fit (Loehlin, 1998). The RMSEA has several advantages, and one is that it is relatively insensitive to sample size. In addition, it takes model complexity into account, which means that it favours few free parameters to be estimated. Different levels of the RMSEA have been discussed, but both Browne and Cudek (Browne & Cudeck, 1993), as well as Lohelin (Loehlin, 1998) have suggested that a RMSEA of 0.05 or less indicates a very good model fit, and that an RMSEA of 0.08 or below indicates a good model fit. The goodness-of-fit index (GFI) varies from 0 to 1. As with χ^2 , a large sample size pushes the GFI up. Though analogies are made to R-square, the GFI cannot be interpreted as per cent of error explained by the model. Rather, it is the per cent of observed covariances explained by the covariances implied by the model. That is, R^2 in multiple regression deals with error variance whereas the GFI

deals with error in reproducing the variance-covariance matrix. As the GFI often runs high compared to other fit models, some suggest using 0.95 as the cut-off value (e.g. Byrne, 2001). By convention, the GFI should be equal to or greater than 0.90 to accept the model. Adjusted goodness-of-fit index (AGFI) is a variant of the GFI which uses mean squares instead of total sums of squares in the numerator and denominator of $1 - \text{GFI}$. It, too, varies from 0 to 1, and an $\text{AGFI} > 1.0$ is associated with just-identified models and models with almost perfect fit. $\text{AGFI} < 0$ is associated with models with extremely poor fit, or based on small sample size (Garson, 2005). The AGFI should also be at least 0.90. Another measure is the Comparative Fit Index (CFI). It was developed by Bentler (1990) and is directly based on the non-centrality measure. The CFI varies from 0 to 1 and has a cut-off criterion of 0.90 when the model can be said to fit the data well. However, Hu and Bentler (1995) later concluded that in order to claim a good fit between the hypothesized model and the observed data the CFI should be close to 0.95. The expected cross-validation index (ECVI) developed by Browne and Cudeck (1993) emphasizes that simple models that fit well stand a better chance of fitting well in a new sample than models that are not simple (hence the term cross-validation). The ECVI value gives an indication of the chance of the model to be reproduced – the lower ECVI value, the better the model is supposed to cross-validate in a new sample (Loehlin, 1998). A total evaluation of the various fit indices was emphasized since the various fit indices put weight on different aspects. If all indices indicated a satisfactory fit, it was taken as strong evidence for a good correspondence between the hypothesized model and the observed covariance matrix.

Missing data: It may be noted that missing data takes place in most samples and for different reasons. A basic distinction can be made between structurally missing data, and accidentally missing data (Gustafson & Stahl, 2000). Both types of missingness are viewed as relevant in this study. The first, structural missingness (or missingness by design), is relevant because it is the consequence of decisions not to observe all variables for all subjects in the sample, such as when the response rate is low. The latter – accidentally missingness – is also relevant as it is missingness which occurs when the planned set of observations could not be obtained for reasons such as non-response or coding errors. To ignore missing data may seem innocuous, but it has important implications for the analyses. According to Gustafson and Stahl (2000) the aforementioned two types of missing data accounted should be dealt with in at least five different ways: 1) modelling incomplete data; 2) estimation

of the complete covariance matrix; 3) imputation; 4) pairwise deletion; and 5) listwise deletion.

A common method to avoid losing data due to different deletion techniques (e.g. pairwise deletion) is the mean substitution of missing data. According to George and Mallery (2005) an often-used rule of thumb suggests that it is acceptable to replace up to 15 per cent of data by the mean of the distribution with little damage to the resulting outcomes. The method replaces all missing data in a variable by the mean of that variable. There are both advantages and disadvantages with this method compared to pairwise deletion. The main advantage is that it produces 'internally consistent' sets of results ('true' correlation matrices)¹. At least three disadvantages are also present. The first is that missing data may reduce the precision of calculated statistics because there is less information than originally planned. This leads to an artificial decrease of the variation of scores, which decreases the individual variables proportional to the number of missing data (i.e. the more missing data, the more 'perfectly average scores' will be artificially added to the data set). The second is that cases with missing values can be systematically different from cases without missing values. This can obscure the results because mean substitution may change the values of correlations considerably since it substitutes missing data with artificially created 'average' data points. The third disadvantage is that the assumptions behind many statistical procedures are based on complete cases, and missing values can complicate the theory required. To address the problem caused by incomplete data, missing value analysis was conducted. The missing value procedure performs three primary functions. First, it describes the pattern of missing data: where the missing values are located, how extensive they are, whether pairs of variables tend to have values missing in different cases, whether data values are extreme, and whether values are missing randomly. Second, it estimates means, standard deviation, covariances, and correlations using different methods (e.g. listwise, pairwise, regression, or expectation-maximization (EM) method). Third, it fills in (imputes) missing values with estimated values using regression or EM methods.

After using missing value analyses, the results show that the missingness was between 0.2% and 3.6% for all of the variables, with most of them clustering around 1%. For 17 of the questions in the second questionnaire the missingness was 8.2%. The background for this was that the respondents were instructed that only those holding a driving licence were to answer the questions.

¹ <http://www.statsoft.com/textbook/stbasic.html#Correlationsk>

In the total sample 9.8% answered 'No' to the question about having a driving licence, and of the ones answering the second questionnaire 8.3% reported not holding a driving licence. In Norway, the SSB (2006a) reported that 87.2% of the adult population have a driving licence and thereby those holding a driving licence are overrepresented. An analysis of variance (ANOVA) was conducted to investigate whether there was a difference between respondents who held a driving licence and those who did not. No significant difference was found.

Hence, non-response in some groups of the population may cause skewed results. One way of investigating this in the study was to look at the difference in risk perception between the counties. Because the response rate was 37%, information was gathered on the response rate between the 19 different counties in Norway. The response rate was somewhat different in these counties (Table 2). The 0-hypothesis was that there was no difference. This was investigated by means of a non-parametric analysis in SPSS and a multilevel regression analysis in MIWin. The analyses were based on a two-level analysis where the counties constitute the highest level and the individual respondents the lowest level. The relative importance of geographical unit versus individual differences for risk perception was investigated. The results showed that there were no significant variations across counties even though the response rate varied to a certain extent. A nearly identical pattern was found in follow-up study.

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Table 2.

Response Rate and Real Distribution of Inhabitants in Norwegian Counties

County	<i>Numbers in %</i>	<i>Real distribution in Norway</i>
Akershus	11.2	10.7
Buskerud	4.0	5.3
Finnmark	1.4	1.6
Hedemark	5.4	4.1
Hordaland	9.5	9.7
Møre og Romsdal	4.1	5.3
Nord Trøndelag	2.7	2.8
Nordland	5.0	5.1
Oppland	3.4	4.0
Oslo	12.4	11.5
Rogaland	9.8	8.5
Sogn og Fjordane	1.2	2.3
Sør Trøndelag	7.7	5.9
Telemark	3.6	3.6
Troms	3.3	3.3
Vest Agder	2.4	3.5
Vestfold	4.4	4.8
Øst Agder	1.9	2.2
Østfold	4.9	5.6

3. Results

3.1. Paper I: Perception of transport risk in the Norwegian Public

The main aim of Paper I was to determine risk perception related to various means of transportation amongst lay people. Plane, train, bus, ferry, boat, car, motorcycle, scooter, bike, and walking (pedestrian) were chosen as relevant means of transportation after investigating numbers from the SSB. When people perceive risk, at least two aspects are given weight. The first is the probability of a negative event, and the second the consequences of such an event. However, there is at least one additional aspect that must be taken into account. It relates to the role of affect. Hence, probability assessment, consequence evaluation, and worry related to experiencing an injury when using different means of transportation was investigated. In addition, questions concerning general risk associated with the same means of transportation were included. In order to obtain adequate information, the respondents were asked to give both general assessments, and assessments concerning the Norwegian public in general.

Exploratory factor analyses showed that transport risks fell into two main categories: public and private means of transportation. When using these factors it was found that respondents assessed the probability of experiencing risk as lower for themselves than for others, and they were more worried about others experiencing a transport-related hazard. Regression analyses were used to investigate whether probability, consequence or worry were most significant to general risk assessment, and overall, worry was found to be the most important predictor. When separating males and females into two groups, gender differences were found. Regression analyses showed that females emphasize worry related to both public and private transportation. For males, worry was found to be most important in relation to public transportation, whereas probability assessments (i.e. cognitive evaluations) were found to be most important to private means of transportation. This implies a difference in how risk should be communicated to the public dependent on the target group.

3.2. Paper II: Determinants of traffic safety – the effect of personality, worry, optimism, attitudes, and willingness to pay

Priority of safety related to transport risks has not been much investigated previously, and therefore it was viewed as appropriate to investigate determinants of transport safety further. Paper II aimed at investigating what predicted priorities of safety. Two questionnaire surveys were conducted during the project period, and the Paper II is based on both. Based on findings from the first questionnaire, a measurement of intentions to prioritize safety was developed and distributed in the follow-up. Several factors were investigated. The personality traits anxiety, excitement-seeking and trust were included. Further factors were driver optimism, worry related to transport risks, willingness to pay to increase safety, and negative attitudes towards traffic rules. These concepts were investigated by means of item response analyses and factor analyses. The further analyses investigated what influences priorities of safety, and involved a regression analysis and structural equation modelling. The regression analysis revealed that trust was not important to priority of safety, and was therefore excluded from the further analysis. A path model was used to test the five determinants of priority of safety. Findings indicated that the personality trait anxiety did not have a direct effect on demand for risk mitigation, but had an indirect effect through worry related to transport risks. On this basis, it was concluded that personality traits influence worry and attitudes. Anxious individuals report more worry and less optimism compared to individuals scoring high on excitement-seeking. Driver optimism and willingness to pay was found to have a positive effect, whereas negative attitudes towards traffic rules (as a driver) and excitement-seeking had a negative effect on priorities of safety. Worry was found to be the most important predictor of safety priorities. The model explained 44% of the variance in priority of safety. The effect of worry was investigated further and a total beta value of worry was found to be as high as 0.50. The findings indicate the worry related to transport risks, as well as negative attitudes should not be underestimated when it comes to priority of safety.

3.3. Paper III: Applying the risk-as-feelings framework to explain demand for risk mitigation

When a risk source is viewed as too high, a desire to reduce risk may appear. This is called demand for risk mitigation, and the third paper aimed at investigating whether the risk-as-feelings framework could be applied to explain demand for risk mitigation in transport. The risk-as-feelings hypothesis (Loewenstein et al., 2001) provides a framework for the influence of probability, consequence, and feelings in regard to cognitive evaluation of risk. In this study, intentions to prioritize safety when choosing different means of transportation was viewed as major determinant of mitigation demands. In turn, mitigation demands were seen as the outcome of a risk perception process.

The evaluations subjects had made of their own risk were used in the study, as well as private means of transportation – car, motorcycle, scooter, bike, and walking (pedestrian). To investigate whether the risk-as-feelings framework could be applied in order to explain demand for risk mitigation in private transportation, a structural equation modelling analysis was performed. The fit of the data to the theoretical model was found to be satisfactory. The results showed that the risk-as-feelings framework could explain 30 per cent of demand for risk mitigation and that priority of safety was an important predictor. When including age, gender, and education in a second analysis, the model could explain up to 52 per cent of the variance in risk mitigation demands and 55 per cent of the variance in general risk assessment. It was concluded that both probability assessment and consequence evaluation are important to cognitive risk assessment and feelings. Priorities of safety were found to be an important predictor in demand for risk mitigation.

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4. Discussion

The background to the current thesis was to investigate risk perception related to transport risks on the one hand and the resulting risk decisions and demand for risk mitigation on the other. Specific findings were treated in detail in three articles, and they focus on risk perception, priority of safety, and demand for risk mitigation, respectively. These three processes are seen as occurring at three different stages, with risk perception as the initial stage, intention to prioritize safety as the second stage, and demand for risk mitigation as the outcome of the two. Means of transportation were used as the field of study because they are both common and well known.

4.1. Risk perception

Prior to any kind of risk related decision, the individual has to comprehend that there is a risk source present. When a risk source is perceived and the risk is viewed as too high the individual can decide to take actions to prioritize safety. This was measured by asking respondents about their intentions to prioritize safety in the future. Findings from the theory of planned behaviour suggest that intentions are most important to predict future behaviour, and hence they are regarded as interesting to investigate further. When a risk source is perceived as too high and the intention to prioritize safety is present, the next level is seen as a demand to mitigate the risk.

Perceptions related to transport risks held by the Norwegian public is the first step when looking at transport risks. It was considered necessary to include both cognitive and emotional variables in the model because many theories of choice made under conditions of risk or uncertainty are mostly cognitive and consequentialistic (Loewenstein et al., 2001). These theories assume that people assess both the likelihood and desirability of potential outcomes, and integrate this information through some kind of expectation-based calculus to make a decision. Emotional variables were added for several reasons. Damasio (1994) argued that rationality is not only a product of the analytical mind, but of the experimental one as well. Moreover, research within the psychometric paradigm has turned the focus towards the roles of affect, emotion, and stigma in risk perception (Slovic et al., 2004).

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The ratings of severity of consequences if an accident occurred was in accordance with findings reported within the psychometric paradigm (Fischhoff, Slovic, Lichtenstein, Read, & Combs, 1987). However, before the results are discussed further, several clarifications are necessary. The study differs from investigations executed within the psychometric paradigm in several important ways. According to the psychometric model, risk perceptions are characterized along two dimensions – dread risk and unknown risk. Dread risk includes several factors: the extent of perceived control, catastrophic potential, feelings of dread, and the inequitable distribution of risks and benefits. The evaluation of the extent of personal control and distribution of risks and benefits are most likely a result of cognitive processes whereas catastrophic potential and feelings of dread are a result of more emotional processes. Consequently, dread risk is both cognitive and emotional. This has also been the main criticism made by Sjöberg (1999). The assumption is that affect (a positive or negative feeling toward an object) causes evaluations of an object's riskiness, rather than the other way around. This has been labelled the affect heuristic. Finucane et al. (2000) suggested that affect serves as a cue for many important judgments and decision-making because people use an affect heuristic to make judgments. The psychometric paradigm has, for the most part, used 30 hazards, ranging from contraceptives to commercial aviation. These hazards have been tested on nine rating scales (Fischhoff, Slovic, Lichtenstein, Read, & Combs, 1978). As mentioned previously, level of controllability is important to risk perception (Slovic, 2000) and a differentiation between controllable and uncontrollable risk sources was seen as important. In addition, a common and well-known risk source was preferred and consequently ten transport-related risks were chosen. The means of transportation included both public (uncontrollable) and private (controllable) ones. The difference between ratings of self and others at risk are also found within the theory of unrealistic optimism (see e.g. Weinstein, 1980; see e.g. Weinstein, 1982; Weinstein, Marcus, & Moser, 2005), and hence the respondents were asked to give assessments of both themselves and others. Therefore, the first step was to investigate probability assessment, consequence evaluation and worry related to ten different means of transportation.

Sjöberg (1999) found that perceived risk was mostly related to the probability of harm. Contrary to his findings, worry was found to be the most important variable in this study. As expected, the findings showed a difference between private and public means of transportation (i.e.

controllable and uncontrollable risk sources). The data also showed important differences between males and females. Numerous studies have found differences between the genders (see Byrnes et al., 1999 for a meta-analysis), but the bigger challenge has been to explain why this difference occurs. One possible explanation is suggested here. The findings showed that when controllable risk sources were investigated, worry was most important for females, whereas probability was most important for males. A proposed explanation for this is that females report more and better imagery than males, and they experience emotions more intensely (see Harshman & Paivio, 1987 for a review). Women also report experiencing fear and nervousness more intensely than men do (Byrnes et al., 1999). Given the differences in risk perception, it is seen as beneficial to consider these differences to gain effective risk communication. A lot of money is used by the advertising industry every year and more knowledge will improve the effectiveness of this communication. A recurring question is what kind of campaign would be most effective. Based on the results it is believed that risk communication must be specifically designed for the target group. To give an example, attitude campaigns based on the affective component will most likely have a greater effect on females than males. If this is the target group, the goal may be reached. However, many attitude campaigns aim to reach young males and therefore probability assessment should be emphasized more.

4.2. Safety priorities

When using different means of transportation, it is clear that most people do not want travelling to be dangerous. Most of us have a desire to travel safely from one destination to the next. However, when a risk source is perceived, fear is an urgent topic since it is reasonable to try to minimize risks in daily affairs, such as when travelling to and from work (Blomkvist, 1987). When faced with risk, at least two possible actions may be undertaken, risk-seeking or safety-seeking. Some even deliberately take risks for the thrill of it. The idea that risk-seeking behaviour is conscious and deliberate is implicit in the term 'risk-seeking'. That is, the assumption is that the risk-seeker consciously considers how he or she should act and takes both the risk and other factors into account. Traditionally, risk research has focused on risk-seekers – the individuals who experience accidents and have the 'wrong' attitudes and behaviour. In contrast, safety-

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seeking is seen as behaviour that by nature is directed towards reducing the risk of mortality or injuries (Thuen et al., 1992). Thuen et al. (1992) reported that an extensive literature search in international databases failed to reveal any relevant papers on safety-seeking or synonymous terms, e.g. security seeking. Since then the situation has changed, and today it is possible obtain several hundred hits when conducting an electronic search on both words.

In order to improve behaviour, it is viewed as necessary to know more about what characterizes those who think about safety, and choose what they view as the safest alternative. Hsee and Weber (1997) labelled this risk preference. It is a concept that describes what one does when faced with a risky option and a safer alternative, and the authors found it to be an important predictor of behaviour under risk. When it comes to behaviour, the goal is to reduce risk behaviour and to enhance priorities of safety, as well as the target person's wish to reduce risk. Intentions to prioritize safety involve the fact that people choose the safe option when they have the opportunity. It was seen as a behavioural intention, and therefore it was interesting to investigate related factors.

Little is known about what influences priorities of safety. Therefore, the present study investigated several possible sources of influence. From existing knowledge about the effect of personality, several personality variables were considered to be relevant. To avoid complications, three were selected as being the most important: anxiety, sensation-seeking, and trust. In addition to personality variables, worry about transport risks, driver optimism, negative attitudes towards traffic rules, and willingness to pay to increase safety were under scrutiny. A model was presented to show what influences priority of safety.

Excitement-seeking was thought to have an effect on priorities of safety because individuals who consciously seek risk are viewed as more likely to have a different attitude towards risk taking than individuals who do not seek out risk. These assumptions were supported by the data. Anxious individuals were found to feel more worry about transport risks and to report more driver stress. In contrast, excitement-seekers were found to have more positive self-assessments, more negative attitudes, and to prioritize safety lower. Further support for the proposed model comes from Ajzen and Fishbein's theory of planned behaviour, which state that attitudes are one of three important variables in regard to behavioural intentions. The model presented in Paper II shows that negative attitudes towards rules were found to be related to lower priorities of safety. Hence, influencing attitudes may also have an effect on safety priorities, and this

in turn can have a positive effect on behaviour according to the theory of planned behaviour.

In addition to personality and negative attitudes, driver optimism is related to risk, and hence regarded as important to priority of safety. On the one hand, it was expected that people who scored high in optimism would score lower on intention to prioritize. On the other hand, it can be assumed that people want to protect and preserve their optimism by prioritizing safety. The findings presented in Paper II revealed that driver optimism was associated with higher priority of safety. Hence, protective optimism is one possible explanation for this result. Furthermore, when prioritizing safety, fewer accidents would be likely to happen and hence driver self-assessment and competence may increase whereas driver stress will decrease. Thompson (1981) indicated that feelings of personal control would reduce stress in many situations and this may decrease the accident rates.

Of the proposed variables associated with priority of safety, worry was found to be the most important variable. A person who worries much about potential problems related to transport also prioritizes safety higher. Again, to focus on the emotional aspects of risk in risk communication is seen as beneficial. In sum, the proposed model (in Paper II) explained 44 per cent of the variance, and worry was found to be the most important factor. The total effect of worry was 0.50. In addition, the new measurement of driver optimism seems promising. Findings suggest that the actual skill can be separated from the perceived skill (e.g. DeJoy, 1992; e.g. Groeger & Grande, 1996). Hence, it is regarded as important to look at perceived skill, and future research would benefit from investigating the measure of driver optimism further.

Intention to prioritize safety is seen as a result of high risk perception. This may result in a desire to have the perceived risk reduced and hence, it is related to mitigation demands.

4.3. Demand for risk mitigation

When a risk source is perceived as too high, taking initiative to mitigate risk is one possible response. It is characterized as the purposeful activity by which society informs itself about hazards, decides what to do about them, and implements measures to control them or to mitigate their consequences (Kasperson, Kates, & Hohenemser, 1985). On this level, Kasperson et al. (1985) report that hazard assessment is at least a four-step process, involving

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identification, assignment of priorities, risk estimation, and social evaluation. Identification of risk were seen as the risk perception process, and assignment of priorities was seen as intentions to prioritize safety. Accordingly, the first two levels have been discussed in the previous sections in relation to the individual level of demand for risk mitigation. Future research may benefit from further investigation of risk estimation and social evaluation of risk.

The term risk mitigation is relatively new in risk literature. It was used more generally by Kunreuther, Easterling, Desvousges, Slovic (1990) as to 'recognize public concerns and introduce mitigation and control measures to enhance the long-run safety of the facility' (1990, p. 482). In recent years, more research has been conducted on mitigation (e.g. Flynn, Slovic, Mertz, & Carlisle, 1999; Kunreuther et al., 1990; Rundmo & Moen, 2005; Sjöberg, 1999). However, to my knowledge, a model constructed to explain risk mitigation has not been proposed so far. In Paper III, the risk-as-feelings hypothesis was used as a framework to explain demand for risk mitigation. This model was found interesting for several reasons. First, it represents an alternative model where the role of affect is highlighted (Loewenstein et al., 2001). Since affective responses occur rapidly and automatically, 'reliance on affect and emotion is a quicker, easier, and more efficient way to navigate in a complex, uncertain, and sometimes dangerous world' (Slovic et al., 2004, p. 313). Hence, people use affect heuristics to make judgments and affective processes play a critical role in determining choices. These affective processes may sometimes influence choice without the chooser's awareness. Today, there is a general concord about the influence of affect on risk perception, and the discussion has shifted from whether affect is the cause or effect of risk perception. Relevant theories in this respect include, for example, the appraisal theories of emotions (Roseman et al., 1996), and the cognitive processing theories (Schwarz, 2000). Second, the-risk-as-feelings hypothesis emphasizes the reciprocal relationship between cognitive evaluation of risk and feelings related to risk. In the proposed model, the reciprocal relationship between risk perception and feelings were kept. Third, the risk-as-feelings hypothesis is seen as relevant for mitigation demands because these may be regarded as an outcome of the risk perception process. The results showed that the risk-as-feelings framework could be applied to explain mitigation demands. In accordance with Kasperson et al. (1985), priorities are found to be an important part of the process of demand for risk mitigation.

All three articles in the thesis found an effect resulting affect related to potential risk. According to Slovic et al. (2004), the scientific study of affective rationality is still in its infancy and much research has been conducted on this

theme the past decade, and there is much more to come. People react to the prospect of risk at two levels: they evaluate the risk cognitively, and they react to it emotionally. According to Loewenstein et al. (2001), the two reactions are interrelated, with cognitive appraisals giving rise to emotions and emotions influencing appraisals. However, the two types of reactions have different determinants. Cognitive evaluations of risk are sensitive to probabilities and consequences, and although emotions respond to cognitive evaluations they can also arise with minimal cognitive processing (Zajonc, 1980). Because of these differences, people experience a discrepancy between the fear they experience in connection with a particular risk and their cognitive evaluation of the threat posed by that risk.

Possibly, induced feelings about a risk source may contribute to higher risk perception. However, this is not a panacea when it comes to self-protective behaviour. Anxiety may be a burden in itself and may also induce a defensive reaction that undermines efforts of mitigating risk (Miller et al., 1987). In addition, it has been found that people often prefer not to know, as if they are choosing 'protective ignorance' (Yaniv, Benador, & Sagi, 2004). Rolls (1999) stated:

the puzzle is not only that the emotion is so intense, but also that even with our rational, reasoning capacities, humans still find themselves in these situations, and may find it difficult to produce reasonable and effective behaviour for resolving the situation. (p. 282)

4.4. Limitations of the study and implications for future research

Several lessons were learned during the work on the thesis as well as some implications for future research. Most theories of decision-making under risk have addressed anticipated emotions under risk. This may be one explanation for the different findings in this field. Further support for this was given by Loewenstein et al. (2001), who separated emotions into anticipatory and anticipated emotions. The first is the immediate visceral reactions to risk and uncertainties (probably close to what Slovic (1987) labelled dread risk), whereas the latter is the expected emotions in the future. A potential problem of the thesis is that this distinction was unclear in the wording of the questions. Some of them are more closely linked to reaction to the risk whereas others are linked to

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expected emotions in the future. The risk-as-feeling hypothesis addressed anticipatory emotions. Wang (2006) suggested that one way of disassociating the two kinds of emotions, and their roles in decision-making, was to focus on their quality and specificity. Furthermore, Wang (2006) speculated that regret and rejoicing are most likely anticipated emotions – supported by earlier findings by van der Pligt et al. (1998) – whereas fear and hope are anticipatory. Consequently, more care has to be taken when constructing research design. This emphasizes the importance of examining specific emotions rather than overall affective valence. Future studies would benefit from investigating how different kinds of emotions interact with rational assessment in making decisions, i.e. the role of anticipated, consequential emotions on one hand, and anticipatory, present emotions on the other. This is supported by Sjöberg (2002), who found that the psychometric dimensions form a logically coherent group of variables denoting properties of the hazard and not the reaction to it.

When using a questionnaire the accuracy of the data containing emotions may be reduced because even if a person answer the questions truthfully it may be impossible to disregard the impact of cognition in this process. Since emotion can be separated into primary, secondary and tertiary emotion (Parrott, 2001), it is important to be aware of which level of emotions is being measuring. Parrot (2001) categorized worry as a tertiary emotion where the primary emotion in the category is fear, and the secondary emotion is nervousness. It may be argued that fear is a basic emotion and will therefore precede risk perception, whereas worry is a tertiary emotion which depends on cognitive processes. Feelings and affect were not included in this categorization, probably because they are more general terms which could belong to several categories. As discussed in the Introduction the research on feelings, affect, and emotion have contradicting findings, and the terms have a somewhat ambiguous relation to each other. To follow the argumentation of Parrott (2001), emotions include so many different aspects that it is natural that the results are ambiguous when the terms are not properly operationalized.

According to Loewenstein et al. (2001), divergence between emotional and cognitive reactions occurs for two reasons: (1) emotions respond to probabilities and outcomes differently than cognitive evaluation; (2) emotions are influenced by situational variables that play only a minor role in cognitive evaluations. Hence, it is possible to assume that cognitive evaluation of risk will be more heavily involved when the individual has time to assess the risk, whereas when the threat is immediate they will rely more on affect. As already mentioned there may be a problem with measuring feelings/emotion/affect by a

questionnaire without interfering cognitions. While the term 'worried' may be present in a questionnaire, the primary emotion fear is hard to measure. In addition, the real effect of feelings may be even higher in real life because the cognitive evaluations interfere when using a questionnaire. An experimental study of the effect on feelings on risk perception, priorities of safety, and demand for risk mitigation would be interesting.

Another problem that needs to be addressed is the difference between priorities and demand for risk mitigation. It may be argued that intentions to prioritize safety and mitigation demands are both risk attitudes. However, the question 'When you choose the following means of transportation, how high do you prioritize safety?' was seen as relating to something that happens before mitigation. The outcome of both perceived risk and priorities was measured by asking the question: 'How important do you think it is that the risk of using these means of transportation is reduced?' Preferably, a longitudinal study should be undertaken to investigate the behavioural intention and the actual behaviour. As a result, more could be said about causality. In addition, demand for risk mitigation may also be investigated further with usage of the theory of planned behaviour (TPB) to gain more knowledge of these processes. The theory of planned behaviour may be an important source of information and it would be beneficial to investigate the relationship between TPB and demand for risk mitigation. Do mitigation demands proceed from intention and behaviour or proceed to intention and behaviour? Further studies should look more at the measurement of demand for risk mitigation and would benefit from creating measurements that clearly separates attitudes, priorities of safety, and demand for risk mitigation. In this process, an additional point is that even though a person may prioritize safety he or she does not necessarily demand risk mitigation. This is seen as an active step and requires at least two conditions: 1) trust that the authorities will do something; 2) a minimum of political engagement.

Much has been written about unrealistic optimism, illusion of control, and internal versus external attribution in relation to risk perception (e.g. Busby, 1996; Cohn, Macfarlane, Yanez, & Imai, 1995; K. Davidson & Prkachin, 1997; Todesco & Hillman, 1999). Extreme internal explanatory style may result in the illusion of control and therefore result in less favourable perception of risk. Studies have found optimism to have an impact on risk perception and risk behaviour (E.g. Davidson, 1997; Rutter, Quine, & Albery, 1998; van der Pligt, 1996). This research has been in the tradition of dispositional optimism and has not taken the other direction within optimism research into account –

explanatory style. Explanatory style is a cognitive personality variable that reflects how a person habitually explains the causes of bad events (Peterson & Seligman, 1984). Seligman (1990) labelled this learned optimism because he found that only 25% was heritable, whereas the rest was learned and could therefore be influenced in a variety of ways. Learned optimism ties these variables together and it may be believed that this knowledge can be used to teach workers in hazardous occupations to perform more safely. Further research should investigate whether it is appropriate to separate the elements of learned optimism in a way that makes them testable for risk behaviour. Since pessimists view negative events as a result of internal, permanent, and global causes, whereas optimists view negative events as external, temporary, and specific the first two dimensions may be important in order to recover quickly following an accident, whereas the latter results in an unwillingness to learn from mistakes. That is, when accidents are attributed externally (blame something or someone else when negative events occur) there will be less learning from experience, and the individual will be more at risk. To my knowledge, the effect of learned optimism on risk perception and risk behaviour has not been reported in previous studies. These dimensions may also teach us something about gender differences, since the attribution pattern has been found to vary between genders.

If the assumption is correct and individuals scoring high on all three dimensions experience more injuries than those scoring high on permanence and pervasiveness, and low on externality, it would enable us to predict those exposed to injuries, and thereby teach them to take more responsibility concerning accidents, and use this e.g. when selecting employees for high-risk occupations. For many reasons, future studies examining risk perception may benefit from a change in focus – from examining those who seek risk to those who seek safety.

4.5. Methodological issues

Social desirability responding implies the respondent's willingness to manipulate his or her answers according to what he or she regards as socially appropriate – which are well-known methodological problems related to the use of self-report data. Generally, questionnaires are 'often criticised as research tools due to the problem of response bias' (Shapiro et al., 1998, p. 146). Several reasons for response bias may be present: a) a deliberate attempt to present a preferred image of themselves ('faking good'); b) an in-built tendency to answer

‘yes’ or ‘no’ to questions (producing ‘response set’); and c) the respondent does not know the answer to the question. Self-ratings are the simplest and best way to address some psychological phenomena, while in regard to other phenomena they are notoriously poor (Wildavsky & Dake, 1990, p. 46). There are many advantages of data collection by mail survey, hence a mail questionnaire was used in the study: they are relatively low in cost, geographically flexible, they can reach a widely dispersed sample simultaneously (Kanuk & Berenson, 1975), represent time convenience for respondents, they eliminate interviewer bias, and are low cost compared to phone or face-to-face methods (Fox, Crask, & Kim, 1988).

An important assumption in using self-report questionnaires is the accuracy of individual responses (Shapiro et al., 1998). Lajunen and Summala (1995) recommended that self-report studies of driving should control for social desirability responding because it is generally recognized that people tend to under-report negative behaviour (e.g. impaired driving) and over-report positive behaviour (e.g. seat belt use) (Jonah & Dawson, 1987). In addition, self-reports in their very nature assume accurate memory for events as well as a willingness to report these to a researcher (Breakwell, Hammond, & Fife-Schaw, 1995). The present study did not control for such biases in responding, and cannot rule out the possibility of biased responses. However, this was regarded as a minor problem because the questions were simple assessments of probability, consequence, worry, and general risk, and did not involve questions related to self-reported driving behaviour. Furthermore, questions that could reveal something that people might not want to convey to the researcher were avoided as far as possible, since sensitive and socially undesirable behaviour is often misreported if reported at all.

Another methodological problem in the study is related to the relatively low response rate. Low response rates and non-response bias are ongoing concerns when conducting mail surveys (Greer, Chuchinprakarn, & Seshadri, 2000), and a systematic difference between respondents and non-respondents in a survey is plausible. This may, in turn, threaten the external validity of the results. Iversen (2004c) conducted a study of non-respondents in the Norwegian public and did not find substantial differences between respondents and non-respondents. The important question is whether the results of the thesis can be generalized to the population. Although no definite answer is provided here, the distribution of age, gender, education, and geography indicates a distribution of the respondents that closely represents that of the general population in Norway.

Introduction

As stated by Cook and Campbell (1979), the social sciences assume causal relations, which cannot be tested according to positivistic standards. Typical for social sciences are that the triggering factor for a phenomenon is purposive human acts that often actuate unintentional a social course of events. This implies that the phenomenon must be explained by both causal and intentional explanations. Furthermore, as argued by Petridou and Moustaki (2000), causality is rarely, if ever, unifactorial in this field of research. Blalock (1961) stated that there is a gap between theory and method in the social sciences because we tend to think in terms of causality, when we only can observe correlations. We are not able to observe or prove causal laws. In this case, the concept of causality is only a pragmatic tool to create order and meaning of the surrounding world. Nevertheless, the social sciences have tried to develop analyses that can test causality. These tools can control for some unwanted effects, e.g. spurious relations. These analyses are named causal analyses and they test the relationship between theory and data, although not after positivistic standards. Structural equation modelling (SEM), a path analytic approach, is an example of causal analysis. SEM-analysis is an important tool to test how variables are related to each other and to test the fit of the data to the model. In the work for this thesis SEM was used to test the relationship between, for example, personality, feelings, cognitive assessments of risk, behavioural intentions, and demand for risk mitigation. However, although named a causal analysis, the SEM-analysis cannot decide the direction of the causality in itself. The direction of causality must always be grounded in theory and logic as well as empirical findings. Everitt and Dunn (1991) noted, that 'however convincing, respectable and reasonable a path diagram may appear, any causal inferences extracted are rarely more than a form of statistical fantasy'. The arrows in path models reflect hypotheses about causation; however, the model merely illuminates which of two or more competing models – derived from theory – are most consistent with the pattern of correlations found in the data.

5. References

- Adams, J. (1995). *Risk*. London: UCL Press.
- Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior*. Englewood Cliffs, NJ: Prentice-Hall.
- Ajzen, I., & Fishbein, M. (2005). The influence of attitudes on behavior. In D. Albarracín, B. T. Johnson & M. P. Zanna (Eds.), *The Handbook of Attitudes* (pp. 173-221). Mahwah, NJ: Lawrence Erlbaum Associates.
- Alberini, A., Cropper, M., Krupnick, A., & Simon, N. B. (2004). *Willingness to pay for mortality risk reductions: Does latency matter?* Washington: Resources for the Future.
- Althaus, C. E. (2005). A disciplinary perspective on the epistemological status of risk. *Risk Analysis*, 25, 567-588.
- Armitage, C. J., & Conner, M. (1999). The theory of planned behaviour: Assessment of predictive validity and 'perceived control'. *British Journal of Social Psychology*, 38, 35-54.
- Beck, U. (1992). *Risk society: Towards a new modernity*. London: Sage.
- Beirness, D. J. (1993). Do we really drive as we live? The role of personality factors in road crashes. *Alcohol, Drugs and Driving*, 9, 129-143.
- Bentler, P. M. (1990). Comparative fit indices in structural models. *Psychological Bulletin*, 107, 238-246.
- Bernstein, P. L. (1995). Risk as a history of ideas. *Financial Analysts Journal*, January-February, 7-11.
- Berry, D. C. (2004). *Risk, communication and health psychology*. Maidenhead: Open University.
- Blalock, H. M. (1961). *Causal inferences in non-experimental research*. Chapel Hill, NC: University of North Carolina Press.
- Blomkvist, A. C. (1987). Public transportation fears and risks. In L. Sjöberg (Ed.), *Risk and society: Studies of risk generation and reactions to risk. The risks and hazards series* (Vol. 3, pp. 159-173). Cambridge, MA: Unwin Hyman.
- Boholm, Å. (1998). Comparative studies of risk perception: a review of twenty years of research. *Journal of Risk Research*, 1, 135-163.
- Breakwell, G. M., Hammond, S., & Fife-Schaw, C. (1995). *Research methods in psychology*. London: SAGE publications.

- British Medical Association. (1990). *The BMA Guide to Living with Risk*. London: Penguin.
- Brosius, H. B., & Engel, D. (1996). The causes of third-person effects: unrealistic optimism, impersonal impact, or generalized negative attitudes towards media influence? *International Journal of Public Opinion Research*, 8, 142-162.
- Browne, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In J. S. Long & K. A. Bollen (Eds.), *Testing structural equation models* (pp. 137-162). Newbury Park, CA: Sage.
- Busby, J. S. (1996). Optimism and calibration in risk assessment: A note in reply to Hartz and Elrod. *Human Systems Management*, 15, 257-261.
- Byrne, B. M. (2001). *Structural equation modelling with AMOS: Basic concepts, applications and programming*. London: Lawrence Erlbaum Associates.
- Byrnes, J. P., Miller, D. C., & Schafer, W. D. (1999). Gender differences in risk taking: A meta-analysis. *Psychological Bulletin*, 125, 364-383.
- Carver, C. S., & Scheier, M. (2000). *Perspectives on personality* (4th ed.). Boston: Allyn and Bacon.
- Carver, C. S., & Scheier, M. F. (2002). Optimism. In C. R. L. Snyder & S. J. E. Lopez (Eds.), *Handbook of positive psychology* (pp. 231-243). New York: Oxford University Press.
- Clarke, V. A., Lovegrove, H., Williams, A., & Machperson, M. (2000). Unrealistic optimism and the health belief model. *Journal of Behavioural Medicine*, 23, 367-376.
- Cohn, L. D., Macfarlane, S., Yanez, C., & Imai, W. K. (1995). Risk Perception: differences between adolescents and adults. *Health Psychology*, 14, 217-222.
- Cook, A., & Campbell, A. (1979). *Quasi-experimentation: Design and analysis for field settings*. Chicago: Rand McNally.
- Coolican, H. (1999). *Research methods and statistics in psychology* (Vol. 3). London: Hodder & Stoughton.
- Costa, P. T., & McCrea, R. R. (1992). *Revised NEO personality inventory (NEO PI-R) and NEO five-factor inventory (NEO-FFI) professional manual*. Odessa, FL: Psychological Assessment Resources Inc.
- Dake, K. (1991). Myths and Nature: Culture and the social construction of risk. *Journal of Social Issues*, 48, 21-37.
- Damasio, A. R. (1994). *Descartes error: Emotion, reason, and the human brain*. New York: Avon.

- Davidson, D. J., & Freudenburg, W. R. (1996). Gender and environmental risk concerns: A review and analysis of available research. *Environment and Behavior, 28*, 302-339.
- Davidson, K., & Prkachin, K. (1997). Optimimism and unrealistic optimism have an interacting impact on health-promoting behavior and knowledge changes. *Personality and Social Psychology Bulletin, 23*, 617-625.
- Deery, H., Kowadlo, N., Westphal-Wedding, T., & Fildes, B. (1998). *Identifying subtypes of young novice drivers: Implications for matching training to the needs of the driver* (No. 142). Victoria: Monash University Accident Research Centre.
- Dejoy, D. M. (1989). The optimism bias and traffic accident risk perception. *Accident Analysis & Prevention, 21*, 333-340.
- DeJoy, D. M. (1992). An examination of gender differences in traffic accident risk perception. *Accident Analysis & Prevention, 24*, 237-246.
- Douglas, M. (2001). Culture as explanation: cultural concerns. *International Encyclopedia of the Social & Behavioral Sciences*.
- Douglas, M., & Wildavsky, A. (1982). *Risk and culture: An essay on selection of technological and environmental dangers*. Berkley: University Press.
- Eagly, A. H., & Chaiken, S. (1993). *The psychology of attitudes*. Fort Worth, TX: Harcourt Brace Jovanovich.
- Ekman, P., & Davidson, R. J. (1994). *The nature of emotion. Fundamental questions*. New York: Oxford University Press.
- Elander, J., West, R., & French, D. (1993). Behavioral correlates of individual differences in road-traffic crash risk: An examination of methods and findings. *Psychological Bulletin, 113*, 279-294.
- European Union. (2003). *Road safety: Road safety action programme (2003-2010)*. Retrieved 22 December, 2005, from <http://europa.eu.int/scadplus/leg/en/lvb/l24257.htm>
- Everitt, B. S., & Dunn, G. (1991). *Applied multivariate data analysis*. London: Edward Arnold.
- Finucane, M. L., Alhakami, A., Slovic, P., & Johnson, S. M. (2000). The affect heuristic in judgments of risks and benefits. *Journal of Behavioral Decision Making, 13*, 1-17.
- Fischer, G. W., Morgan, M. G., Fischhoff, B., Nair, I., & Lave, L. B. (1991). What risks are people concerned about. *Risk Analysis, 11*, 303-314.
- Fischhoff, B., Slovic, P., Lichtenstein, S., Read, S., & Combs, B. (1987). How safe is safe enough? A psychometric study of attitudes toward

- technological risks and benefits. In R. E. Löfstedt (Ed.), *Perception of risk* (pp. 80-103). London: Earthscan Publication Ltd.
- Fischhoff, B., Slovic, P., Lichtenstein, S., Read, S., & Combs, B. (1978). How safe is safe enough? A psychometric study of attitudes towards technological risks and benefits. *Policy Sciences*, *9*, 127-152.
- Fiske, S. T., & Taylor, S. E. (1991). *Social cognition* (2nd ed.). New York: McGraw-Hill.
- Flynn, J., Slovic, P., & Mertz, C. K. (1994). Gender, race and environmental health risks. *Risk Analysis*, *14*, 1101-1108.
- Flynn, J., Slovic, P., Mertz, C. K., & Carlisle, C. (1999). Public support for earthquake risk mitigation in Portland, Oregon. *Risk Analysis*, *19*, 205-216.
- Fox, R. J., Crask, M. R., & Kim, J. (1988). Mail survey response rate: A meta analysis of selected techniques for inducing response. *Public Opinion Quarterly*, *52*, 229-247.
- Fredrickson, B. L., & Joiner, T. (2002). Positive emotions trigger upward spirals toward emotional well-being. *Psychological Science*, *13*, 172-175.
- Frewer, L. J., Howard, C., Hedderley, D., & Shepherd, R. (1998). Methodological approaches to assessing risk perceptions associated with food-related hazards. *Risk Analysis*, *18*, 95-102.
- Garson, G. D. (2005). *Structural Equation Modelling*. Retrieved 24 January, 2006, from <http://web.ics.purdue.edu/~mlei/Report/SEM.pdf>.
- George, D., & Mallery, P. (2005). *SPSS for Windows step by step. A simple guide and reference. 12.0 Update*. Boston: Pearson Education.
- Glendon, A. I., Dorn, L., Davis, D. R., Matthews, G., & Taylor, R. G. (1996). Age and gender differences in perceived accident likelihood and driver competencies. *Risk Analysis*, *16*, 755-762.
- Graham, J. D., & Rhomberg, L. (1996). How risks are identified and assessed. *ANNALS*, *545*, 15-24.
- Greer, T. V., Chuchinprakarn, R., & Seshadri, S. (2000). Likelihood of participating in mail survey research: Business respondents' perspectives. *Industrial Marketing Management*, *29*, 97-109.
- Groeger, J. A., & Grande, G. E. (1996). Self-preserving assessments of skill? *British Journal of Psychology*, *87*, 61-79.
- Gustafson, J., & Stahl, P. A. (2000). *STREAMS user's guide. Version 2.5 for Windows*. Mölndal: Multivariate Ware.
- Gustafson, P. (1998). Gender differences in risk perception: Theoretical and methodological perspectives. *Risk Analysis*, *18*, 805-812.

- Harshman, R. A., & Paivio, A. (1987). Paradoxical sex differences in self-reporting imagery. *Canadian Journal of Psychology, 41*, 303-316.
- Higgins, N. C., St Amand, M. D., & Poole, G. D. (1997). The controllability of negative life experiences mediates unrealistic optimism. *Social Indicators Research, 42*, 299-323.
- Hsee, C. K., & Weber, E. U. (1997). A fundamental prediction error: self-others discrepancies in risk preference. *Journal of Experimental Psychology: General, 126*, 45-53.
- Hu, L., & Bentler, P. M. (1995). Evaluating model fit. In R. H. Hoyle (Ed.), *Structural Equation Modelling: Concepts, Issues and Applications* (pp. 76-99). London: Sage Publications.
- Hyperdictionary. (2005). *Mitigation*. Retrieved April 19, 2005, from <http://www.hyperdictionary.com/search.aspx?define=mitigation>
- Iversen, H. (2004a). Associations between driver stress, locus of control and reported risk behaviour in traffic, *Department of Psychology, Trondheim, Norway: Psychology*.
- Iversen, H. (2004b). Risk-taking attitudes and risky driving behaviour. *Transportation Research Part F: Traffic Psychology and Behaviour, 7*, 135-150.
- Iversen, H. (2004c). *Risk behaviour in traffic. A study investigating relationships between attitudes, personality, stress and behaviour*. NTNU, Trondheim.
- Jonah, B. A., & Dawson, N. E. (1987). Youth and risk: Age differences in risky driving, risk perception, and risk utility. *Alcohol, Drugs and Driving, 3*, 13-29.
- Kanuk, L., & Berenson, C. (1975). Mail surveys and response rates: A literature review. *Journal of Marketing Research, 12*, 440-453.
- Kasperson, J. X., Kates, R. W., & Hohenemser, C. (1985). Hazard management. In R. W. Kates, C. Hohenemser & J. X. Kasperson (Eds.), *Perilous Progress. Managing the hazards of technology*. (pp. 43). Boulder, CO: Westview Press, Inc.
- Klinke, A., & Renn, O. (2002). A new approach to risk evaluation and management: Risk-based, precaution-based, and discourse-based strategies. *Risk Analysis, 22*, 1071-1094.
- Klonowicz, T. (2002). Unrealistic optimism and real life: The role of threat, neuroticism, and extraversion in unrealistic optimism. *Polish Psychological Bulletin, 33*, 27-39.

Introduction

- Kobbeltvedt, T., Brun, W., Johansen, B. H., & Eid, J. (2005). Risk as feelings or risk and feelings? A crosslagged panel analysis. *Journal of Risk Research, 8*, 417-437.
- Kraus, N. N., & Slovic, P. (1988). Taxonomic analysis of perceived risk: modelling individual and group perceptions. *Risk Analysis, 8*, 435-455.
- Krimsky, S., & Golding, D. (1992). *Social theories of risk*. New York: Praeger.
- Kunreuther, H., Easterling, D., Desvousges, W., & Slovic, P. (1990). Public attitudes toward siting a high-level nuclear waste repository in Nevada. *Risk Analysis, 10*, 469-484.
- Lajunen, T., & Summala, H. (1995). Driving experience, personality, and safety-motive dimensions in drivers' self-assessments. *Personality and Individual Differences, 19*, 307-318.
- Loehlin, J. C. (1998). *Latent variable models. An introduction to factor, path and structural analysis* (3 ed.). Hillsdale, N.J.: Erlbaum.
- Loewenstein, G. F., Weber, E. U., Hsee, C. K., & Welch, N. (2001). Risk as feelings. *Psychological Bulletin, 127*, 267-286.
- MacGregor, D. (1991). Worry of technological activities and life concerns. *Risk Analysis, 11*, 315-324.
- Mahatane, J., & Johnston, M. (1989). Unrealistic optimism and attitudes towards mental health. *British Journal of Clinical Psychology, 28*, 181-182.
- Marek, J. (1985). Evaluation of work environment: Survey design, analysis and presentation of results. In O. H. Hellesøy (Ed.), *Work environment Statfjord Field, work environment, health and safety on a North Sea oil platform* (pp. 402-412). Bergen: Universitetsforlaget.
- McGregor, B. A., Bowen, D. J., Ankerst, D. P., Andersen, M. R., Yasui, Y., & McTiernan, A. (2004). Optimism, perceived risk of breast cancer, and cancer worry among a community-based sample of women. *Health Psychology, 23*, 339-344.
- McKenna, F. P. (1983). Accident proneness: a conceptual analysis. *Accident Analysis & Prevention, 15*, 65-71.
- McKenna, F. P. (1993). It won't happen to me: Unrealistic optimism or illusion of control? *British Journal of Psychology, 84*, 39-50.
- McKenna, F. P., & Albery, I. P. (2001). Does unrealistic optimism change following a negative experience? *Journal of Applied Social Psychology, 31*, 1146-1157.
- Merriam-Webster Online Dictionary. (2006a). *Feeling*. Retrieved April 10, 2006, from <http://www.m-w.com/dictionary/feeling>

- Merriam-Webster Online Dictionary. (2006b). *Mitigation*. Retrieved April 20, 2006, from <http://www.m-w.com/dictionary/mitigation>
- Miller, G. A., Levin, D., Kozak, M., Cook, E., McLean, A., & Lang, P. (1987). Individual differences in imagery and the psychophysiology of emotion. *Cognition and Emotion, 1*, 367-390.
- Moen, B. E., & Rundmo, T. (2005). Predictors of unrealistic optimism: A study of Norwegian risk takers. *Journal of Risk Research, 8*, 363-382.
- Nathanson, D. (1992). *Shame and pride, affect, sex and the birth of the self*. London: W W Norton.
- Nunnally, J. C. (1978). *Psychometric theory* (2 ed.). New York: McGraw-Hill.
- Olstedal, S., & Rundmo, T. (2006). The effects of personality and gender on risky driving behaviour and accident involvement. *Safety Science, 44*, 621-628.
- Parrott, W. (2001). *Emotions in social psychology*. Philadelphia: Psychology Press.
- Peterson, C., & Seligman, M. E. P. (1984). Causal explanations as a risk factor for depression: theory and evidence. *Psychological Review, 91*, 347-374.
- Petridou, E., & Moustaki, M. (2000). Human factors in the causation of road traffic crashes. *European Journal of Epidemiology, 16*, 819-826.
- Rayner, S., & Cantor, R. (1987). How fair is safe enough? The cultural approach to societal technology choice. *Risk Analysis, 7*, 3-9.
- Renn, O. (1992). Concepts of risk: A classification. In S. Krimsky & D. Golding (Eds.), *Social theories of risk* (pp. 53-79). Westport: Praeger.
- Robbins, A. S., Spence, J. T., & Clark, H. (1991). Psychological determinants of health and performance: the tangled web of desirable and undesirable characteristics. *Journal of Personality and Social Psychology, 61*, 755-765.
- Rohrman, B. (1994). Risk perception of different societal groups: Australian findings and cross-national comparisons. *Australian Journal of Psychology, 46*, 150-163.
- Rolls, E. T. (1999). *The brain and emotion*. New York: Oxford University Press.
- Rosa, E. A. (2003). The logical structure of the social amplification of risk framework (SARF): Metatheoretical foundation and policy implications. In N. K. Pidgeon, R.E. Kasperson & P. Slovic (Ed.), *The social amplification of risk*. (pp. 47-79). Cambridge: Cambridge University Press.

- Roseman, I., Antoniou, A. A., & Jose, P. E. (1996). Appraisal determinants of emotions: Constructing a more accurate and comprehensive theory. *Cognition and Emotion, 10*, 241-277.
- Rothengatter, T., & Vaya, E. C. (1997). *Traffic and transport psychology: Theory and application*. Amsterdam, Netherlands: Pergamon/Elsevier Science Inc.
- Rundmo, T. (1994). Occupational accidents and objective risk on North Sea offshore installations. *Safety Science, 17*, 103-116.
- Rundmo, T., & Moen, B. E. (Submitted). Risk sensitivity, risk perception, worry, and risk tolerance as predictors of priority of safety and demand for risk mitigation in transport. *Safety Science*.
- Rutter, D. R., Quine, L., & Albery, I. P. (1998). Perception of risk in motorcyclists: Unrealistic optimism, relative realism and prediction of behavior. *British Journal of Psychology, 89*, 681-696.
- Schulman, P., Keith, D., & Seligman, M. E. P. (1993). Is optimism heritable? A study of twins. *Behaviour research and therapy, 31*, 569-574.
- Schwarz, N. (2000). Emotion, cognition, and decision making. *Cognition and Emotion, 14*, 433-440.
- Seligman, M. P. (1990). *Learned Optimism. How to change your mind and your life*. New York: Pocket Books.
- Shapiro, R., Siegel, A. W., Scovill, L. C., & Hays, J. (1998). Risk-taking patterns of female adolescents: What they do and why. *Journal of Adolescence, 21*, 143-159.
- Sjöberg, L. (1997). Explaining risk perception: An empirical evaluation of cultural theory. *Risk Decision and Policy, 2*, 113-130.
- Sjöberg, L. (1999). Consequences of perceived risk: Demand for mitigation. *Journal of Risk Research, 2*, 129-149.
- Sjöberg, L. (2002). *Risk perception and policy: The psychometric paradigm revisited*. Stockholm: Center for Risk Research.
- Sjöberg, L. (2006). Will the real meaning of affect please stand up? *Journal of Risk Research, 9*, 101-108.
- Slovic, P. (1987). Perception of risk. *Science, 236*, 280-285.
- Slovic, P. (1992). Perception of risk: Reflection on the psychometric paradigm. In S. Krimsky & D. Golding (Eds.), *Social theories of risk* (pp. 117-152). New York: Praeger.
- Slovic, P. (1993). Perceived risk, trust, and democracy. *Risk Analysis, 13*, 675-682.

- Slovic, P. (1999). Comment: Are trivial risks the greatest risks of all? *Journal of Risk Research*, 2, 281-288.
- Slovic, P. (2000). *The perception of risk*. London: Earthscan.
- Slovic, P., Finucane, M. L., Peters, E., & MacGregor, D. (2004). Risk analysis and risk as feelings: Some thoughts about affect, reason, risk, and rationality. *Risk Analysis*, 24, 311-322.
- Slovic, P., Fischhoff, B., & Lichtenstein, S. (1985). Characterizing perceived risk. In C. H. C. Kates & J. X. Kasperson (Eds.), *Perilous progress: Managing the hazards of technology*. Boulder: Westview Press.
- Slovic, P., Peters, E., Finucane, M. L., & MacGregor, D. G. (2005). Affect, risk, and decision making. *Health Psychology*, 24, S35-40.
- Smith, T. W., Pope, M. K., Rhodewalt, F., & Poulton, J. L. (1989). Optimism, neuroticism, coping, and symptom reports: An alternative interpretation of the life orientation test. *Journal of Personality & Social Psychology*, 56, 640-648.
- Spielberger, C. D., Gorsuch, R. C., & Lushene, R. E. (1970). *Manual for the state trait anxiety inventory*. Palo Alto, CA: Consulting Psychologists Press.
- Statistics Norway. (2004). *Dødsfall etter kjønn, alder og underliggende dødsårsak. Hele landet. 2004*. Retrieved May 20, 2006, from <http://www.ssb.no/emner/03/01/10/dodsarsak/tab-2006-06-01-02.html>
- Statistics Norway. (2006a). *Fører kort, etter klasse og innehavernes kjønn og alder*. Retrieved May 12, 2006, from <http://www.ssb.no/aarbok/tab/tab-424.html>
- Statistics Norway. (2006b). *Innenlandsk persontransport, etter transportmåte*. Retrieved May 12, 2006, from <http://www.ssb.no/emner/10/12/transpinn/tab-2007-07-03-01.html>
- Stroebe, W., & Stroebe, M. S. (1995). *Social psychology and health*. Buckingham: Open University Press.
- Taylor, S. E., & Brown, J. D. (1998). Illusion and well-being: A social psychological perspective on mental health. *Psychological Bulletin*, 103, 193-210.
- The British Medical Association. (1990). *The BMA Guide to Living with Risk*. London: Penguin.
- Thompson, M., & Wildavsky, A. (1982). *The risk analysis controversy: An institutional perspective*. New York: Springer-Verlag.
- Thompson, S. C. (1981). Will it hurt less if I can control it? A complex answer to a simple question. *Psychological Bulletin*, 90, 89-101.

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- Thuen, F., Klepp, K. I., & Wold, B. (1992). Risk-seeking and safety-seeking behaviours: A study of health-related behaviours among Norwegian school children. *Health Education Research, 7*, 269-276.
- Todesco, P., & Hillman, S. B. (1999). Risk perception: Unrealistic optimism or realistic expectancy. *Psychological Reports, 84*, 731-738.
- Ulleberg, P., & Rundmo, T. (2003). Personality, attitudes and risk perception as predictors of risky driving behaviour among young drivers. *Safety Science, 41*, 427-443.
- van der Pligt, J. (1996). *Perceived risk, comparative optimism and behaviour*. Paper presented at the Contemporary psychology in Europe: Theory, research, and applications: Proceedings of the IVth European Congress of Psychology, Seattle.
- van der Pligt, J., Zeelenberg, M., van Dijk, W. W., de Vries, N. K., & Richard, R. (1998). Affect, attitudes and decisions: Let's be more specific. *European Review of Social Psychology, 8*, 33-66.
- Waller, P. F. (1996). *Transportation and society - The role of values*. Retrieved April 01, 2005, from <http://www.druglibrary.org/schaffer/Misc/driving/s1p4.htm>
- Wang, X. T. (2006). Emotions within reason: Resolving conflicts in risk preference. *Cognition and Emotion, 20*, 1132-1152.
- Weinstein, N. D. (1980). Unrealistic optimism about future life events. *Journal of Personality and Social Psychology, 39*, 806-820.
- Weinstein, N. D. (1982). Unrealistic optimism about susceptibility to health problems. *Journal of Behavioral Medicine, 5*, 441-460.
- Weinstein, N. D. (1987). Unrealistic optimism about susceptibility to health-problems - Conclusions from a community-wide sample. *Journal of Behavioral Medicine, 10*, 481-500.
- Weinstein, N. D. (1989). Effects of personal experience on self-protective behavior. *Psychological Bulletin, 105*, 31-50.
- Weinstein, N. D., Marcus, S. E., & Moser, R. P. (2005). Smokers' unrealistic optimism about their risk. *Tobacco Control, 14*, 55-59.
- Weinstein, N. D., & Nicolich, M. (1993). Correct and incorrect interpretations of correlations between risk perceptions and risk behaviors. *Health Psychology, 12*, 235-245.
- Wildavsky, A., & Dake, K. (1990). Theories of risk perception: Who fears what and why? *Daedalus, Journal of the American Academy of Arts and Science, 112*, 41-60.

- World Health Organization. (2004). *World report on road traffic injury prevention*. Geneva: World Health Organization.
- World Knowledge Library. (2007). *Traffic psychology*. Retrieved August 15, 2007, from <http://www.masterliness.com/a/Traffic.psychology.htm>
- Yaniv, I., Benador, D., & Sagi, M. (2004). On not wanting to know and not wanting to inform others: choices regarding predictive genetic testing. *Risk Decision and Policy, 9*, 317-336.
- Zajonc, R. B. (1980). Feeling and thinking: Preferences and no inference. *American Psychologist, 35*, 151-175.

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Perception of transport risk in the Norwegian Public

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Perception of transport risk in the Norwegian Public

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Abstract

The main aim of the present study is to examine risk perception in transport among a representative sample of the Norwegian public. Further aims include probability assessment, consequence evaluation and worry in regard to experiencing an injury when using different means of transportation. The results are based on two questionnaire surveys carried out among a representative sample of the Norwegian public in 2004. The results showed that transport risks fell into two main categories; public and private means of transportation. Respondents assessed the probability of experiencing risk as lower for themselves than others, and they were also more worried about others experiencing a transport hazard. Overall, worry was found to be the most important predictor of risk perception. Females were found to emphasize worry in regard to both public and private transportation. Worry was found to be most important in regard to public transportation, whereas probability assessments (i.e. cognitive evaluations) were found to be most important in regard to private means of transportation. This difference may guide how risk is communicated to the public.

KEY WORDS: risk perception, probability, consequence, worry

Introduction

The development of society is marked by increased mobility. Using different means of transportation to travel from one place to another is a common and important part of everyday life for most people. Traditionally, transportation has been defined as the safe and efficient movement of people and goods (Waller,

1996). The development of a safe and efficient transportation system has dominated the field of risk research. Despite this effort, what characterises the majority of transport risks is that the probability of a negative event is considered larger than other potentially hazardous risk sources, e.g. nuclear power plants. However, the catastrophic potentials, i.e. the consequences, are not as great as for many other types of risk sources (aviation is an exception). Even though governments try to make transportation as safe as possible, accidents still happen, unfortunately. In 2003 alone, 280 people lost their lives on Norwegian roads, and a total of 11, 851 persons were injured. Most people are aware of these accidents and thereby have some comprehension of the risk involved in using different means of transport. Accidents are a health problem and have an effect on both individuals and the society. It is thereby considered important to understand the process of risk perception in order to lower the accident involvement. The main purpose of this paper was to investigate the perception of transport risks in the Norwegian public.

Rosa (2003, p. 56) defined risk as 'a situation or an event where something of human value (including humans themselves) is at stake and where the outcome is uncertain'. Transportation risk includes both criteria. People will interpret potential risk differently, and risk perception is usually seen as the subjective assessment of the probability of a specific accident happening, and how concerned we are about the consequences. But potential hazards may also cause worry and concern, and consequently, affective aspects are also involved in risk judgement (Rundmo & Sjöberg, 1995).

Sjöberg (1999) criticised the field of risk perception research because most of the work has been carried out on risks of the type that has small probability and large consequences. In this study, transport risk was chosen for two main reasons: i) the risk can be both big and small (different consequences) and ii) most people will have had experiences with the types of risks of using different types of transportation.

Three main areas have been identified as important when dealing with risk: probability, consequence and worry. For different means of transportation, the probability and consequences of an accident vary immensely – an aviation accident is very different from an accident taking place while driving a scooter or walking. The probability of an accident and the consequences of the same accident can be assessed differently, and the affective response to this evaluation will also vary. Fischhoff et al. (1978) investigated thirty different risk sources in the US. Some of these were means of transportation. When rating the severity of consequences of transport risks, aviation was rated as having the

highest consequences whereas bicycle and railroad were rated as having the lowest consequences. An identical investigation was conducted in Hungary (Englander, Farago, Slovic, & Fischhoff, 1986), and overall, Hungarians were found to perceive risks as lower than American subjects. Based on all the different risk sources, Americans were found to be most concerned about “high-tech” risks whereas Hungarians appeared to be relatively more concerned about common, everyday hazards of life due to accidents with cars, bicycles, trains, boats, electric appliances and so on. The same risk sources were studied by Teigen, Brun, and Slovic (1988), and showed that Norwegian subjects rated risk sources somewhere between the American and Hungarian subjects. As for transport risks, motorcycles, and motor vehicles were rated as most dangerous in the three studies whereas tractors and bicycles were rated at the safest end of the scale. Public transportation was rated in the middle part of the assessed risk scale. However, these samples were all convenience samples, and conclusions based on these may be doubtful.

The above-mentioned studies concentrated on general risk. Numerous studies have found that people rate themselves and others differently (e.g. Brosius & Engel, 1996; Clarke, Lovegrove, Williams, & Machperson, 2000; Klonowicz, 2002; Mahatane & Johnston, 1989; McKenna, 1993; McKenna & Albery, 2001; Taylor & Brown, 1998; Weinstein, 1980). People rate the risk for themselves as lower than for others, and they assess the probability of experiencing an injury as less. This difference can be seen as a result of unrealistic optimism in regard to experiencing an injury (Weinstein, 1982). McKenna (1993) stated that it is not so much that individuals believe that negative events will not happen, but rather that these events are assessed as relatively unlikely to happen to them. When the majority of people perceive the possibility of a negative event happening to them as less than average, this is clearly not just optimistic, but also unrealistic (some of them may be correct, while others are mistaken). A difference in the assessment of self and others in regard to the risk sources is expected, and this difference is expected to influence risk perception.

Means of transportation differ in several ways. Firstly, private means of transportation are often related to road use (like driving a car, motorcycle, scooter, bike or walking), and will more often involve less people than most public means of transportation (like plane, train, bus, boat and ferry). Therefore, more people are involved during an accident in the public sector than in the private. Secondly, fewer accidents happen in the public than in the private sector, and third, some risk sources are more controllable than others. The

perceived controllability was investigated by Fischhoff et al. (2000). Of the 6 means of transportation, bicycle, motorcycle and motor vehicles were rated as the most controllable whereas railroad and aviation were rated as less controllable. As passengers in a plane we do not have any control (except avoiding usage), whereas the level of control when driving a car or a motorcycle is much higher. Many studies show a difference between perception of risk where one is in control versus not being in control (e.g. Holmes, Gifford, & Triggs, 1998; Horswill & McKenna, 1999; Jonah, 1986; Langer, 1975). One of the results of the increased feeling of control was found in drivers where perceived control over the driving task amplifies intended driving speeds (Hammond & Horswill, 2001). The dimensionality of transport risks has not been investigated sufficiently. In addition, public and private transport risks may be divided in other dimensions such as sea versus land, land versus air, and rail versus road. The second aim of the study was to determine dimensionality of risk perception in transport.

So far, the importance of probability, consequences and worry have been established, but within the risk research area there has been an ongoing discussion about which of these are most important when assessing risk (Palm, 1999; Sjöberg, 1999, 2000; Slovic, 1999). The issue of probability is incontestable when it comes to perceiving risk. If a person knows for certain that he or she either will experience the effect of a risk or knows that he or she is completely safe from harm, there is no risk assessment involved, and the term risk perception makes no sense. The consequences of a risk source are also viewed as important because different risk sources have different consequences. Some are usually trivial (e.g. stumbling on the street) while others are lethal (e.g. a plane crash). Evaluations of serious consequences include mental images of risk, and potential hazards may thereby cause worry and concern. Consequently, an affective component is involved (Rundmo & Sjöberg, 1998). The relative importance of these three predictors is not agreed upon, and the third aim of the present study was to examine the relative importance of probability, consequences and worry in regard to perceived risk.

Differences in risk perception due to sex, age, and education

Males and females have in numerous studies been found to perceive risk differently, and generally females report more risk than men (Byrnes, Miller, & Schafer, 1999; Gustafson, 1998). In particular, women have been found to

express higher levels of concern over technology and the environment than men do (Davidson & Freudenburg, 1996; Iversen & Rundmo, 2002). This result was confirmed by other studies that also showed that women were more worried and concerned when thinking about environmental risks compared to men, and also perceived risk to be greater (Iversen & Rundmo, 2002; Sjöberg, 1994, 1999). However, Greenberg and Schneider (1995) found no gender differences in risk perception in stressed neighbourhoods. This study showed that when the respondents were exposed to the same level of hazards, they had the same level of concern.

Of the risk sources often examined, three main areas have been studied – environmental, health and traffic risks – and different results and risk evaluations have been found. Many studies have been conducted on gender differences in regard to traffic risks, and also on environmental and health risks (e.g. Byrnes et al., 1999; DeJoy, 1992; Flynn, Slovic, & Mertz, 1994; Glendon, Dorn, Davis, Matthews, & Taylor, 1996; Greenberg & Schneider, 1995; Gustafson, 1998), but few have been conducted on transport risks in general. No hypothesis about the effect of gender was made besides a potential difference between public and private transportation. This was because males, compared to females, have been found to possess an exaggerated sense of driving competence and perceive less risk in a variety of dangerous driving behaviours (DeJoy, 1992).

Age has been found to influence risk perception and risk taking behaviour. In general, young respondents report lower level of risk than older respondents. Younger drivers have been found to perceive risk as lower than older drivers (e.g. Cohn, Macfarlane, Yanez, & Imai, 1995; DeJoy, 1992; Farrand & McKenna, 2001; Hakamies-Blomqvist & Peters, 2000). Young drivers have also been found to underestimate the probability of specific risks in traffic situations (Brown & Groeger, 1988), overestimate their own skills (Dejoy, 1989), and perceive the hazards in traffic less holistically (Deery, 1999). Men aged between 18 and 20 seem to be less risk averse than older men and women (Drottz-Sjöberg & Sjöberg, 1991), and people above 60 years old seem to be more fearful than younger people (Box, Hale, & Andrews, 1988).

The third independent variable included in this study was education. Less educated people tend to worry more and to express more fear than better educated people (Levy & Guttman, 1986). That is, the higher the level of education, the lesser is the risk often judged to be. Age and education were therefore expected to influence risk perception. Younger respondents with a high level of education were expected to perceive risk as lower than older

respondents with low education. The fourth aim of this study was to investigate differences in perceived risk due to gender, age and education.

Methods

Sample

To achieve the aims of the study, a questionnaire was distributed to a representative sample of the Norwegian public. The sample was drawn from the national registration office (Folkeregisteret), and a mail questionnaire was distributed in the spring of 2004. A follow-up was distributed in the fall of 2004. Of the 990 questionnaires distributed in the follow up, 510 were returned – an overall response rate of 52 per cent (no reminders). Analyses showed that the distribution of respondents was close to the distribution of the population. The respondents consisted of 49 per cent men and 51 per cent women, and according to the National Bureau of Statistics (Statistisk Sentralbyrå), the actual distribution is 50.4 and 49.6. The respondents' mean age was 41.73, and the mean in the Norwegian public of people between 18 and 65 is between 40 and 41. Furthermore, 25 per cent of the respondents were from the four largest cities in the country, a fact which also reflects the actual distribution of the population.

Questionnaire

Risk perception was operationally defined as the level of risk respondents perceive and report on rating scales of risk. To investigate risk assessment in transport, 10 common means of transportation were chosen: plane, train, bus, ferry, boat, car, motorcycle, scooter, bike and feet (pedestrian). The dimensions studied were: (1) probability of harm; (2) assessment of consequence; (3) worry about experiencing an injury; and (4) general risk assessment. All scales in the questionnaire consisted of seven-point scales of the Likert type, and the scale ranged from one (very unlikely to experience an injury) to seven (very likely to experience an injury). The first three questions were asked in regard to both self and others whereas the fourth was a general measurement of how high they assessed the different risks to be.

Statistical procedure

Descriptive statistics with mean and standard deviation was used in order to gain an overview of the different means of transportation. Exploratory factor analyses were carried out in order to examine the dimensionality of the different means of transportation and to replace the great number of single items by indices (i.e., probability, consequence, worry and risk assessment). Cronbach's (1951) alpha coefficient was applied in order to appraise homogeneity of the items within the different means of transportation. Nunnally (1978) recommends that the alpha coefficient should be equal to or higher than 0.70 if a set of items are to make up a scale. Correlations (Pearson's r) were calculated in order to estimate the relationship between risk assessment and probability, consequence and worry. Multiple regression analyses (stepwise) were applied in order to investigate the influence of probability, consequences and worry on risk perception. One analysis for the whole sample and separate analyses for men and women were conducted.

Results

Table 1 shows simple descriptive reports, and the means and standard deviations (in brackets) are given. In three of the four areas – probability, worry and general risk assessment – private means of transportation were scored higher than public transportation. In contrast, consequences of accidents associated with public means of transportation were considered higher than private. The table shows that the probability assessment for air travel was lowest, and the assessment for motorcycle was highest. The consequences associated with a plane crash were regarded as highest whereas the consequences of a bike accident were lowest. The respondents reported to be most worried about experiencing an accident on a bike whereas they were least worried about a train accident. The general risk perception results showed that the respondents assessed the risk of using a motorcycle as highest, and the risk of using trains as lowest.

Table 1 shows that 81.4 percent of the respondents regarded the probability of experiencing a plane accident as very unlikely or unlikely, whereas the same assessment for a car accident was 16.3%. 95.8% regarded the consequence of an accident with an airplane as disastrous whereas only 20.9% regarded the consequences of a car accident as disastrous. 61.8% responded that

they worry little about plane accidents whereas 48.5% reported to be worried about car accidents.

Table 1.

Probability, Consequence, Worry, and General Risk Perception – Self and Others

	Probability		Consequence		Worry		Risk perception
	Self	Others	Self	Others	Self	Others	
Plane	1.90 (1.09)	2.08 (1.25)	6.78 (0.70)	6.39 (1.15)	2.73 (1.95)	3.09 (2.09)	2.63 (1.24)
Train	2.07 (1.06)	2.70 (1.37)	5.25 (1.17)	4.98 (1.22)	2.12 (1.45)	2.50 (1.60)	2.61 (1.07)
Bus	2.76 (1.14)	3.44 (1.37)	4.51 (1.10)	4.42 (1.14)	2.20 (1.32)	2.61 (1.51)	3.00 (1.10)
Ferry	2.24 (1.12)	2.69 (1.30)	4.81 (1.43)	4.23 (1.38)	2.20 (1.40)	2.56 (1.56)	2.73 (1.11)
Boat	2.51 (1.21)	3.07 (1.36)	5.24 (1.30)	4.67 (1.33)	2.43 (1.49)	2.89 (1.64)	2.99 (1.12)
Own car	3.86 (1.37)	4.72 (1.51)	4.69 (1.10)	4.29 (1.28)	2.85 (1.50)	3.27 (1.72)	3.84 (1.24)
Motor-cycle	3.88 (1.94)	5.34 (1.37)	5.68 (1.35)	5.36 (1.22)	3.56 (1.97)	4.41 (1.87)	4.40 (1.59)
Scooter	3.69 (1.89)	5.16 (1.40)	5.15 (1.43)	4.96 (1.32)	3.25 (1.88)	3.99 (1.85)	4.13 (1.55)
Bike	3.61 (1.53)	4.66 (1.51)	4.20 (1.52)	4.05 (1.50)	3.64 (1.55)	3.16 (1.76)	3.49 (1.35)
Pedestrian	3.42 (1.57)	4.16 (1.64)	4.46 (1.59)	4.20 (1.46)	2.32 (1.48)	2.78 (1.90)	3.27 (1.38)

Bold numbers indicating the means of transportation with highest and lowest assessments

Dimensionality of risk assessments

Factor analyses were conducted on the different variables to investigate the dimensionality of the measurements. The factor analyses of probability, consequence, worry and risk perception resulted in two factors on each of them – public and private means of transportation. To investigate the reliability of the factors, Cronbachs alpha and total inter item were used, and the results showed

that these were satisfactory (see Table 2). The same factors were found when respondents were asked to rate the risk for others.

Table 2.

Factor Analysis of Probability, Consequences, Worry, and Risk Perception

		Probab	Conseq.	Worry	Risk perc
Public	Alpha	.52	.799	.909	.885
	Corrected inter item	.66	.58	.78	.72
Private	Alpha	.811	.823	.880	.848
	Corrected inter item	.60	.62 ¹	.71	.65
Cumulative explained variance		61.20	57.69	72.33	67.12

Table 3.

Correlation between General Risk Assessment and Probability, Consequence and Worry

	General risk assessment	
	Public	Private
Probability – Others	.35**	.33**
Probability – Self	.51**	.58**
Consequence – Others	.09*	.28**
Consequence - Self	.23**	.39**
Worry - Others	.47**	.38**
Worry - Self	.60**	.59**

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

General risk assessment was correlated to all three factors believed to be important in regard to risk perception (both for self and others). In particular, respondents who rated general risk to be high also assessed the probability of risk to be high. This was found for both public and private means of transportation. The probability assessment of self was more highly correlated to risk assessment than the probability assessment of others (see Table 3). Similarly, there was a high correlation between risk assessment and worry. However, the correlation between general risk assessment and the assessment of consequence for public transportation of others was low (.09).

¹ Note: The number reported in the publication is .31 (which is incorrect).

Correlations between probability, consequences, and worry for public means of transportation were also investigated to see which were most closely connected. Table 4 shows that the respondents who assessed the probability of an accident as high, also reported that they were worried about experiencing an injury. The relationship between consequences and reported worry was lower.

Table 4.

Correlations between Probability, Consequence, and Worry - Public Transportation

	Probability		Consequence		Worry
	Others	Self	Others	Self	Others
Probability – Others	-				
Probability – Self	.33**	-			
Consequence – Others	.26**	.13**	-		
Consequence - Self	.10*	.19**	.29**	-	
Worry - Others	.36**	.36**	.24**	.18**	-
Worry - Self	.31**	.47**	.12**	.24**	.58**

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Table 5.

Correlations between Probability, Consequence, and Worry - Private Transportation

	Probability		Consequence		Worry
	Others	Self	Others	Self	Others
Probability – Others	-				
Probability – Self	.35**	-			
Consequence – Others	.41**	.21**	-		
Consequence - Self	.14**	.29*	.40**	-	
Worry - Others	.36**	.31**	.42**	.22**	-
Worry - Self	.24**	.49**	.29**	.36**	.54**

** Correlation is significant at the 0.01 level (2-tailed).

Table 5 shows the correlation between probability assessment, consequence and worry regarding private means of transportation. The tendency was similar as for public transportation. However, in the private sector, the respondents who assessed the probability of others of experiencing an accident,

also believed that the consequences would be higher. The table also shows that those who regarded consequences as high, scored high on worry.

Predictors of risk perception

The next step was to investigate what influenced risk assessment. As discussed in the introduction, there have been different beliefs about whether probability or consequence is most important in risk perception. The two factors of public and private means of transportation were used to investigate this issue further. The general question about assessing risk was the dependent variable in two stepwise regression analyses, and probability assessment, consequence, and worry were entered as independent variables (one for public and one for private transportation).

The results show that there is a difference in risk perception between public and private transportation. Worry and probability assessment had effects on risk judgment in the public sector, whereas consequences of an accident were also important in the private sector. The results show that risk assessment related to public transportation explained 42.7% of the variance of probability and worry. The perceived consequences of the risk source were excluded in the analysis. For private means of transportation, worry and probability were the two most important variables. Consequences were included in the result, and had a small but significant effect on risk assessment. The three variables explained 48.5% of the variance of risk assessment.

Table 6.

Regression Analyses of Public and Private Means of Transportation - Self

		Beta	Pearsons r	t-value
Public ^a	Worry	.49	.60**	21.6**
	Probability	.26	.51**	13.6**
	Consequence	.07	.23**	3.5**
Private ^b	Worry	.37	.60**	18.0**
	Probability	.35	.58**	17.7**
	Consequence	.16	.40**	8.9**

Dependent variable: general risk assessment public^a and general risk assessment private^b

Adj R square public: .427, Adj R square private: .485

**= p<.05

Furthermore, the same analyses were conducted on the basis of evaluation of others. Table 7 shows the predictors when evaluating others. As for evaluation of oneself, worry was the most important predictor. The explained variance was 23.9% for public transportation and 18.9% for private transportation.

Table 7

Regression Analyses of Public and Private Means of Transportation - Others

		Beta	Pearsons r	t-value
Public ^a	Worry	.39	.46***	9.13
	Probability	.18	.35***	4.20
Private ^b	Worry	.30	.38***	6.96
	Probability	.22	.33***	5.00

Dependent variable: general risk assessment public^a and general risk assessment private^b

Adj R square public: .239, Adj R square private: .189

**= p<.05

Differences due to gender, age and education

Tables 8 and 9 show the results of simple descriptive reports of gender, age and education in regard to risk assessments for self and others, respectively. The tables show mean and standard deviation (in brackets). The numbers in bold are the lowest assessments in each category, and they show that males regarded risk as lowest on all three variables compared to females. Individuals under 25 years regarded the risk as lower than the rest (except probability assessment, private), and those with high education generally assessed the risk as lower than those with lower education.

Two separate analyses were conducted to explore the possibility that different factors may be important to males and females. The results in Table 10 show that there was in fact a difference between the genders. Worry was found to be more important to both females and males in regard to public transportation. In contrast, their evaluation of private transportation differed, and probabilities were found to be more important for males whereas worry was most important for females. Worry and probability explained 36% of the variance in general risk assessment in the public sector for females whereas worry, probability and consequences explained 50% of the variance in the private sector. The same tendency was found for men in the public sector, and worry, probability and consequences explained 52% of the variances with standardized beta values of .48, .30 and .14 respectively. For private transportation, probability was most important, and the three variables explained

49% of the variance. The standardized beta values were found to be .44 for probability, .30 for worry and .12 for consequences.

Table 8.

Gender, Age and Education in regard to Public and Private transportation - Self

	Probability		Consequence		Worry	
	Public	Private	Public	Private	Public	Private
<i>Gender</i>						
Female	2.44 (0.94)	3.77 (1.27)	5.46 (0.85)	4.91 (1.03)	2.54 (1.36)	3.07 (1.39)
Male	2.13 (0.82)	3.64 (1.28)	5.14 (0.85)	4.74 (1.13)	2.09 (1.19)	2.75 (1.36)
<i>Age</i>						
→ 25	2.13 (0.96)	3.80 (1.30)	5.06 (0.99)	3.96 (0.89)	2.01 (1.18)	2.65 (1.36)
26-34	2.33 (0.89)	3.75 (1.25)	5.34 (0.78)	4.78 (1.11)	2.26 (1.36)	2.67 (1.35)
35-43	2.21 (0.84)	3.65 (1.25)	5.43 (0.78)	4.88 (0.97)	2.29 (1.28)	2.80 (1.31)
44-52	2.32 (0.83)	3.64 (1.33)	5.35 (0.94)	4.97 (1.15)	2.60 (1.45)	3.23 (1.58)
53 →	2.40 (0.96)	3.75 (1.29)	5.30 (0.88)	4.88 (1.12)	2.33 (1.26)	3.10 (1.33)
<i>Education</i>						
Primary School	2.50 (1.35)	3.70 (1.47)	5.26 (0.84)	4.91 (1.32)	2.71 (1.71)	3.36 (1.77)
College, vocational	2.36 (0.95)	3.80 (1.35)	5.36 (0.89)	5.01 (1.13)	2.46 (1.41)	3.03 (1.45)
College, intelligible	2.28 (0.87)	3.69 (1.26)	5.36 (0.83)	4.68 (1.01)	2.43 (1.36)	2.89 (1.38)
University	2.21 (0.72)	3.65 (1.21)	5.29 (0.88)	4.77 (1.01)	2.12 (1.09)	2.83 (1.29)

Table 9.

Gender, Age and Education in regard to Public and Private transportation - Others

	Probability		Consequence		Worry	
	Public	Private	Public	Private	Public	Private
<i>Gender</i>						
Female	2.88 (1.17)	4.09 (1.33)	4.97 (1.01)	4.67 (1.15)	2.93 (1.57)	3.78 (1.59)
Male	2.70 (1.07)	4.74 (1.28)	4.92 (0.83)	4.49 (1.07)	2.51 (1.29)	3.28 (1.39)
<i>Age</i>						
→ 25	2.52 (1.03)	4.65 (1.41)	4.78 (0.77)	4.29 (0.93)	2.56 (1.36)	3.34 (1.44)
26-34	2.80 (1.09)	4.82 (1.27)	4.84 (0.83)	4.64 (1.02)	2.86 (1.63)	3.52 (1.54)
35-43	2.88 (1.08)	4.85 (1.28)	4.99 (0.97)	4.61 (1.09)	2.65 (1.45)	3.49 (1.60)
44-52	2.83 (1.23)	4.91 (1.32)	5.03 (1.18)	4.60 (1.18)	2.93 (1.48)	3.69 (1.47)
53 →	2.81 (1.14)	4.82 (1.27)	5.01 (0.89)	4.65 (1.21)	2.62 (1.34)	3.56 (1.49)
<i>Education</i>						
Primary School	3.08 (1.40)	4.94 (1.20)	5.24 (0.96)	4.60 (1.27)	2.73 (1.63)	3.27 (1.61)
College, vocational	2.89 (1.16)	4.87 (1.47)	4.95 (0.91)	4.82 (1.12)	2.87 (1.47)	3.72 (1.58)
College, intelligible	2.93 (1.13)	5.05 (1.32)	5.00 (0.84)	4.56 (1.04)	3.01 (1.59)	3.68 (1.51)
University	2.60 (0.99)	4.67 (1.18)	4.86 (0.95)	4.45 (1.09)	2.53 (1.32)	3.43 (1.45)

Table 10.

Regression Analyses of Public and Private Means of Transportation – Gender Differences

			Beta	Pearsons r	t-value	Adj R-square
Female	Public ^a	Worry	.44	.55**	8.07**	.30
		Probability	.27	.45**	5.13**	.36
	Private ^b	Worry	.40	.62**	7.73**	.38
		Probability	.29	.54**	5.94**	.46
Male	Public ^a	Consequence	.22	.46**	4.57**	.50
		Worry	.48	.58**	8.96**	.43
		Probability	.30	.66*	5.53**	.50
	Private ^b	Consequence	.14	.29**	3.04**	.52
		Probability	.44	.63**	7.79**	.40
		Worry	.30	.57**	5.32**	.48
		Consequence	.12	.34**	2.40**	.49

Dependent variable: general risk assessment public^a and general risk assessment private^b
 **= p<.05

Discussion

Risk perception in transport among the Norwegian public was examined. There were several findings. Different kinds of transport produced different risk assessments in regard to probability assessment, consequence evaluation and worry. The use of motorcycle was regarded as most probable to lead to an accident whereas transportation by airplane was considered least probable to lead to an accident. The consequence of a plane crash was rated as highest. According to Iversen and Rundmo (2002), it is important to consider the social and situational context where risk assessments are done, such as the media coverage on related subjects at the time of the survey. It is interesting to note that the respondents reported less worry when thinking about potential train accidents even though there have been more major accidents involving trains than airplanes in Norway in recent years. One of the reasons for this may be explained by a good safety record on the railroads prior to the accidents. In addition, the worry related to flying is often higher because people simply find it more comfortable to travel near to the ground. Another explanation may come

from findings related to unrealistic optimism. Unrealistic optimism quickly reinstates itself (Burger & Palmer, 1989); therefore, the negative effect of an accident is not long lasting.

Risk perception is influenced by several factors, including choice of different hazards, the way respondents are asked to assess probability judgements and emotional reactions, and other measures such as dimensions of attitude and behaviour (Iversen & Rundmo, 2002). Risk judgements can be influenced by other factors than probability of a specific outcome, such as voluntariness of exposure, possibility of exerting control, novelty of the hazard, and also less measurable qualities of the outcome, such as 'dreadfulness' and 'catastrophic character' (Slovic, 1987). Several of these factors were investigated in the present study. Evidently, there is a difference between transport risks where people perceive themselves to be in control (private means of transportation), and those where people are not (public means of transportation). Private transportation was viewed as different from public transportation. In addition, the respondents reported that it was more probable that others would experience a dangerous event than themselves, and they were also more worried about this. The results showed a difference between the perceptions of self versus others. The respondents reported that it was more likely that others would experience an accident than themselves on all means of transportation.

Probability and affect were found to be highly correlated. This indicates that assessing something as probable causes a more affective response than the consequence of the same event. This finding was in accordance with Baron, Hershey and Kunreuther's (2000) finding about worry being affected by probability judgments. The causal relationship between probability and affect may be discussed in general because some kinds of affect (e.g. mood) may influence risk assessments. Here, the respondents were asked to rate their worry when thinking about accidents with personal injury while using different means of transportation.

Estimation of probability and consequences and their importance on worry in regard to risk perception was compared. The results indicate that worry was more important than both probability assessment and evaluation of consequences. Hence, in this investigation, the affective component seems to be more important to risk assessments than was assumed Sjöberg (1999). The overall effect of worry was found to be the most important predictor of risk perception of self as well as others. This showed that the importance of worry may be even more substantial than formerly assumed because it would be

natural to assume that the cognitive evaluation of risk would be more important when assessing risk for others. However, the result may have been affected by the fact that two questionnaires were distributed, and the one containing the general risk questions also contained questions about the respondents themselves. Nevertheless, there was a considerably higher amount of explained variance, and this should be taken into account in further research.

When males and females were analyzed separately, worry was most important for both genders in relation to public transportation. Probability was found to be more important in regard to private transportation when it came to the male respondents. Several explanations of the gender difference can be proposed. Women express their feelings in more detail than men, and studies have found women to ponder over explanations of why they react the way they do whereas men will move on to the next challenge and do not think as much about their affective response to an event (Seligman, 1990). According to Horvath and Zuckerman (1993), risk perception is a consequence of behaviour, rather than a cause of it, and it may be assumed that men and women interpret their behaviours differently. The affect they feel when either using different means of transportation or watching mishaps on television may be more important to females than to males.

Other aspects than merely the assessment of probability and consequences may contribute to the affective response people feel when they think about danger. Previous experience with danger has in other studies been found to play an important role (Burger & Palmer, 1989). In addition, the assumption that consequences and worry should be closely connected is partly disputed. The correlation between probability assessment and worry was found to be higher, which indicates that when people assess probability as higher, they tend to worry more than if they view the consequence as high. Thereby, consequence is not as important for risk perception as first anticipated. This finding supports Sjöberg's (1999) notion about consequence being important for demand for risk mitigation whereas probability is more important for risk assessment.

In sum, the results of the study demonstrate the importance of affect in regard to risk perception. Affect was found to be more important to women than men. The results showed that men seemed to evaluate risk more from a cognitive stance regarding the controllable risk sources whereas women seemed to rely more heavily on affective evaluations in general. This finding is in accordance with earlier research, which has found that females experience greater risks than males, especially when the hazards are considered to contain

elements of an emotional or catastrophic kind (Stern, Dietz, & Kalof, 1993). This difference may also account for some of the gender differences found in regard to unrealistic optimism.

More recent studies of perception of terrorist risks have replicated this finding (Lerner, Gonzalez, Small, & Fischhoff, 2003). However, contradictory findings have also been reported. In the United States, non-white males have been found to perceive risks in a similar way as females (Flynn et al., 1994), and these findings are generally accounted for in terms of social roles and status differentiation (Savage, 1993). It may be that women and non-white men perceive risks as higher because they feel that they have less power to influence decisions relating to technological and other hazards. However, these studies are of low interest in a Scandinavian context.

In short, the findings support the importance of affective responses as well as gender differences in risk perception. Attitude campaigns can exploit this knowledge because if worry is more important than probability and consequence it will be more effective to influence the affective component compared to the cognitive. This may be seen in the recent advertisement about seatbelt usage in Norway, where illustrations show someone with the arm of a loved one around them like a seatbelt.

One potential confounding issue in the matter of assessments of probability and consequences is that these assessments take place before and after an accident. Are they directly comparable? Perhaps other factors influence these assessments. This may also explain the low correlation between consequence and worry. Worrying about the likelihood of a potential accident may be a different emotion than worrying about consequences. According to de Blaeij and van Vuuren (2003), there is a distinction between the perception of risk and the perception of the outcome of an uncertain event. Research on anxiety shows that emotional reactions to risky situations often differ from cognitive evaluations of the severity of the hazard (Ness & Klaas, 1994). Future studies should look into this difference.

Conclusion

The present study examined risk perception in transport among a representative sample of the Norwegian public. The results show that transport risks fell into two main categories; public and private means of transportation. Respondents assessed the probability of experiencing risk as lower for themselves than others, and they were also more worried about others experiencing a transport-related danger. Overall, worry was found to be the most important predictor of risk evaluation. Females were found to emphasize worry more on all means of transportation whereas men relied more heavily on probability assessments (i.e. cognitive evaluations) in regard to controllable risk sources. Further studies may benefit from taking all these aspects into account when examining risk perception as well as communication risk to the public.

References

- Baron, J., Hershey, J. C., & Kunreuther, H. (2000). *Determinants of priority for risk reduction: the role of worry*. Retrieved May 5, 2005, from <http://www.sas.upenn.edu/~baron/prot.htm>
- Box, S., Hale, C., & Andrews, G. (1988). Explaining fear of crime. *British Journal of Criminology*, 28, 340-356.
- Brosius, H. B., & Engel, D. (1996). The causes of third-person effects: unrealistic optimism, impersonal impact, or generalized negative attitudes towards media influence? *International Journal of Public Opinion Research*, 8, 142.
- Brown, I. D., & Groeger, J. A. (1988). Risk perception and decision taking during the transition between novice and experienced driver status. *Ergonomics*, 31, 585-597.
- Burger, J. M., & Palmer, M. L. (1989). Changes in and generalization of unrealistic optimism following experiences with stressful events: reactions to the California earthquake. *Personality and Social Psychology Bulletin*, 18, 39.
- Byrnes, J. P., Miller, D. C., & Schafer, W. D. (1999). Gender differences in risk taking: A meta-analysis. *Psychological Bulletin*, 125, 364-383.
- Clarke, V. A., Lovegrove, H., Williams, A., & Machperson, M. (2000). Unrealistic optimism and the health belief model. *Journal of Behavioural Medicine*, 23, 367-376.

- Cohn, L. D., Macfarlane, S., Yanez, C., & Imai, W. K. (1995). Risk Perception: Differences between adolescents and adults. *Health Psychology, 14*, 217-222.
- Cronbach, L. J. (1951). Coefficient alpha and the internal consistency of tests. *Psychometrika, 16*, 297-334.
- Davidson, D. J., & Freudenburg, W. R. (1996). Gender and environmental risk concerns: A review and analysis of available research. *Environment and Behavior, 28*, 302-339.
- de Blaeij, A. T., & van Vuuren, D. J. (2003). Risk perception of traffic participants. *Accident Analysis & Prevention, 35*, 167-175.
- Deery, H. A. (1999). Hazard and Risk Perception among Young Novice Drivers. *Journal of Safety Research, 30*, 225-236.
- DeJoy, D. M. (1989). The Optimism Bias and Traffic Accident Risk Perception. *Accident Analysis & Prevention, 21*, 333-340.
- DeJoy, D. M. (1992). An examination of gender differences in traffic accident risk perception. *Accident Analysis & Prevention, 24*, 237-246.
- Drottz-Sjöberg, B. M., & Sjöberg, L. (1991). Train and transports: Perceived and real risks. *Rhizikon Risk Research Reports, 2*, 1-27.
- Englander, T., Farago, K., Slovic, P., & Fischhoff, B. (1986). Comparative analysis of risk perception in Hungary and the united states. *Social Behaviour, 1*, 55-66.
- Farrand, P., & McKenna, F. P. (2001). Risk perception in novice drivers: the relationship between questionnaire measures and response latency. *Transportation Research Part F: Traffic Psychology and Behaviour, 4*, 201-212.
- Fischhoff, B., Slovic, P., Lichtenstein, S., Read, S., & Combs, B. (1978). How safe is safe enough? A psychometric study of attitudes towards technological risks and benefits. *Policy Sciences, 9*, 127-152.
- Fischhoff, B., Slovic, P., Lichtenstein, S., Read, S., & Combs, B. (2000). How safe is safe enough? A psychometric study of attitudes towards technological risks and benefits. In P. Slovic (Ed.), *The perception of risk* (pp. 80-103). London: Earthscan.
- Flynn, J., Slovic, P., & Mertz, C. K. (1994). Gender, race and environmental health risks. *Risk Analysis, 14*, 1101-1108.
- Glendon, A. I., Dorn, L., Davis, D. R., Matthews, G., & Taylor, R. G. (1996). Age and gender differences in perceived accident likelihood and driver competencies. *Risk Analysis, 16*, 755-762.
- Greenberg, M. R., & Schneider, D. F. (1995). Gender differences in risk perception: Effects differ in stressed vs. non-stressed environments. *Risk Analysis, 15*, 503-511.
- Gustafson, P. (1998). Gender differences in risk perception: Theoretical and methodological perspectives. *Risk Analysis, 18*, 805-812.
- Hakamies-Blomqvist, L., & Peters, B. (2000). Recent European research on older drivers. *Accident Analysis & Prevention, 32*, 601-607.

- Hammond, T. B., & Horswill, M. S. (2001). The influence of desire for control on drivers' risk-taking behavior. *Transportation Research Part F: Traffic Psychology and Behaviour*, 4, 271-277.
- Holmes, N., Gifford, S. M., & Triggs, T. J. (1998). Meanings of risk control in occupational health and safety among employers and employees. *Safety Science*, 28, 141-154.
- Horswill, M. S., & McKenna, F. P. (1999). The effect of perceived control on risk taking. *Journal of Applied Psychology*, 29, 377-391.
- Horvath, P., & Zuckerman, M. (1993). Sensation-seeking, risk appraisal and risk behavior. *Personality and Individual Differences*, 14, 41-52.
- Iversen, H., & Rundmo, T. (2002). Environmental concern and environmental behaviour among the Norwegian public. *Journal of Risk Research*, 5, 265-279.
- Jonah, B. A. (1986). Accident risk and risk-taking behaviour among young drivers. *Accident Analysis & Prevention*, 18, 255-271.
- Klonowicz, T. (2002). Unrealistic optimism and real life: The role of threat, neuroticism, and extraversion in unrealistic optimism. *Polish Psychological Bulletin*, 33, 27-39.
- Langer, E. (1975). The illusion of control. *Journal of Personality and Social Psychology*, 32, 311-328.
- Lerner, J., Gonzalez, R. M., Small, D. A., & Fischhoff, B. (2003). Effects of fear and anger on perceived risks of terrorism: A national field experiment. *Psychological Science*, 14, 144-150.
- Levy, S., & Guttman, L. (1986). Worry, fear and concern differentiated. In C. D. Spielberger & I. G. Sarason (Eds.), *Stress and anxiety* (Vol. 10). Washington: Hemisphere Publishing Corporation.
- Mahatane, J., & Johnston, M. (1989). Unrealistic optimism and attitudes towards mental health. *British Journal of Clinical Psychology*, 28, 181-182.
- McKenna, F. P. (1993). It won't happen to me: Unrealistic optimism or illusion of Control? *British Journal of Psychology*, 84, 39-50.
- McKenna, F. P., & Albery, I. P. (2001). Does unrealistic optimism change following a negative experience? *Journal of Applied Social Psychology*, 31, 1146-1157.
- Ness, R. M., & Klaas, R. (1994). Risk perception by patients with anxiety disorders. *Journal of Nervous and Mental Disease*, 182, 175-182.
- Nunnally, J. C. (1978). *Psychometric Theory* (2 ed.). New York: McGraw-Hill.
- Palm, R. (1999). Perceived risk and the earthquake insurance purchase decision: A commentary on a paper by Lennart Sjöberg. *Journal of Risk Research*, 2, 289-294.
- Rosa, E. A. (2003). The logical structure of the social amplification of risk framework (SARF): Metatheoretical foundation and policy implications. In N. K. Pidgeon, R.E. & Slovic, P (Ed.), *The social amplification of risk*. (pp. 47-79). Cambridge: Cambridge University Press.

- Rundmo, T., & Sjöberg, L. (1995, July 2-7). *Risk perception by offshore oil personnel related to platform movements*. Paper presented at the 4th European Congress of Psychology, Athens, Greece.
- Rundmo, T., & Sjöberg, L. (1998). Risk perception by offshore oil personnel during bad weather conditions. *Risk Analysis*, *18*, 111-118.
- Savage, I. (1993). Demographic influences on risk perceptions. *Risk Analysis*, *13*, 413-420.
- Seligman, M. P. (1990). *Learned Optimism. How to change your mind and your life*. New York: Pocket Books.
- Sjöberg, L. (1994). *Perceived risk vs. demand for risk reduction*. Stockholm: RHIZIKON: Risk Research Reports.
- Sjöberg, L. (1999). Consequences of perceived risk: Demand for mitigation. *Journal of Risk Research*, *2*, 129-149.
- Sjöberg, L. (2000). Consequences matter, 'risk' is marginal. *Journal of Risk Research*, *3*, 287-295.
- Slovic, P. (1987). Perception of risk. *Science*, *236*, 280-285.
- Slovic, P. (1999). Comment: Are trivial risks the greatest risks of all? *Journal of Risk Research*, *2*, 281-288.
- Stern, P. C., Dietz, T., & Kalof, L. (1993). Value orientations, gender, and environmental concern. *Environment and Behavior*, *25*, 322-348.
- Taylor, S. E., & Brown, J. D. (1998). Illusion and well-being: a social psychological perspective on mental health. *Psychological Bulletin*, *103*, 193-210.
- Teigen, K. H., Brun, W., & Slovic, P. (1988). Societal risks as seen by the Norwegian public. *Journal of Behavioural Decision Making*, *1*, 111-130.
- Waller, P. F. (1996). *Transportation and society - The role of values*. Retrieved April 01, 2005, from <http://www.druglibrary.org/schaffer/Misc/driving/s1p4.htm>
- Weinstein, N. D. (1980). Unrealistic Optimism About Future Life Events. *Journal of Personality and Social Psychology*, *39*, 806-820.
- Weinstein, N. D. (1982). Unrealistic optimism about susceptibility to health problems. *Journal of Behavioral Medicine*, *5*, 441-460.

Determinants of safety priorities in transport – the
effect of personality, worry, optimism, attitudes
and willingness to pay

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Determinants of safety priorities in transport – the effect of personality, worry, optimism, attitudes and willingness to pay

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Abstract

Much research within risk has investigated risk perception and how risk behaviour is understood by the public. One goal of risk research is to understand how people perceive and interpret risk to facilitate safe behaviour. This is seen as important for many different reasons, one being because policy measures might be more effective when they address and understand individual differences in beliefs and perceptions of a target group (Steg, L., Sievers, I., 2000. Cultural theory and individual perceptions of environmental risks. *Environment and Behavior* 32 (2), 250–269). The main aim of this study was to investigate what is most important in regard to safety priorities. Three personality assets – anxiety, excitement-seeking and trust – were first examined. Further factors were driver optimism, worrying about transport risks, willingness to pay to increase safety, and negative attitudes toward traffic rules' (as a driver). The results are based upon two questionnaire surveys carried out among a representative sample of the Norwegian public in 2004. The results showed that worry was the most important predictor of safety priorities. In addition, negative attitudes towards rules were also found to have an impact on priority. The proposed model explained 44% of the variance of safety priority. This knowledge gives additional information to improve the success of interventions because it will develop the ability to target those who consider safety a low priority and guide them to modify their attitudes. This may in turn increase their value of safety.

KEY WORDS: traffic safety, personality, optimism, worry, priorities

Introduction

In modern society many risk sources are present, and one of these are different means of transportation, which cause a lot of fatalities worldwide. Of all modes of transport, transport by road is the most dangerous and the most costly in terms of human lives. The Road Safety Action Programme (2003-2010) proposes a series of measures to reduce fatalities. These measures includes increasing checks on road traffic, deploying new road safety technologies, improving road infrastructure and taking measures to improve users' behaviour. The latter is important because it is estimated that about 90% of accidents can be attributed to human error (McKenna, 1983). In order to improve user behaviour, it is necessary to know how the users think about the involved risk when using means of transportation, and also whether they care about the risk involved. When faced with risk, at least two possible actions may be undertaken, risk-seeking or safety-seeking. Traditionally, risk research has been focused on risk-seekers – the individuals who experience accidents and have the ‘wrong’ attitudes and behaviour. Even though accidents happen it has been argued that there are not enough accidents to make valid and reliable assumptions about the trends in non-accidents. Therefore, it is considered appropriate to investigate what characterises those who think about safety, and also choose what they view as the safest alternative. Prioritizing safety involves the fact that people choose the safe option when they have the opportunity. With increased knowledge concerning what influences priorities, one may gain the ability to influence people’s priorities and hence increase safety. The main aim of this study was to describe the association between safety priority and selected personality assets (i.e. anxiety, sensation seeking and trust) as well as worry about transport risks, driver optimism, and attitudes toward traffic rules (will be referred to as attitudes in the rest of the paper). In addition, willingness to pay to increase safety (will be referred to as willingness to pay hereafter) was included. A further specification of the aims is presented in the following.

When a person is asked how he or she prioritizes safety when making different choices, it is seen as a behavioural intention. Intention is an indication of a person's readiness to perform a given behaviour, and it is considered to be the immediate antecedent of behaviour (Ajzen, 1991). Behavioural intention is regarded as the motivation necessary in order to engage in a particular behaviour: the more one intends to engage in a behaviour, the more likely should its performance be (Armitage & Conner, 1999). Hence, knowledge about how

different individuals prioritize safety and predictors of these priorities is viewed as important in regard to safe choices. Hence, the first aim of this paper was to test the measurements for priority of safety, worry, attitudes, driver optimism, and willingness to pay.

At no time will we all agree on a single level of acceptable risk (Berry, 2004), and different individuals will make different choices in regard to both risk and safety. People's perception of risk will vary, and their perception as well as the way they react to risk, depend on a range of factors – like culture, personality and previous experience. Consequently, in conjunction with studying the obvious factors (like the actual physical danger), personality is found to influence how people act and react in regard to risk. Personality constitutes the individual's characteristic patterns of behaviours, thoughts and feelings (Carver & Scheier, 2000). Hence, personality should be predictive of a wide variety of behavioural tendencies, including risk perception. In fact, personality has been proposed as an individual characteristic related to risk perception (Bouyer, Bagdassarian, Chaabanne, & Mullet, 2001). A great deal of this research has been aimed at using personality variables in order to predict various kinds of risk taking behaviour, such as risky driving (Arnett, Offer, & Fine, 1997; Iversen & Rundmo, 2002; Jonah, 1997; Jonah, Thiessen, & Au-Yeung, 2001; Rundmo & Iversen, 2004; Ulleberg & Rundmo, 2002). Altogether, the results indicate that there is a relationship between personality and how people deal with different risk sources. Oltedal and Rundmo (2006) found that anxiety was significantly correlated to excitement-seeking and also to risky driving behaviour. In the current study, driver behaviour was not at interest, rather the safety priority the respondent reported. In addition to excitement-seeking, which was found important by both Beirness (1993) and anxiety which was found important in Oltedal and Rundmo (2006), trust was investigated in the present study because it has been found to be important to risk assessment in earlier studies (Moen & Rundmo, 2005; Slovic, Flynn, & Layman, 1991). In addition to the personality of individuals, personality profiles of hazards have dominated the field. In fact, Barnett and Breakwell (2001) argued that this dominance and the consequent emphasis on personality profiles of hazards has resulted in little attention being given to individual variability in risk judgments. In addition to personality, other factors have been found to be important in regard to risk perception and some of these factors are investigated in the present study.

Sjöberg (2006) argued that the perception of severity of consequences is not the same as emotion, although emotional effects may arise from considering some severe consequences of accidents, or the use of certain technologies and

facilities. Hence, the word affect should be used to denote emotion. He concluded that it is clear that affect/emotion is of only minor importance in risk perception. Others (e.g. Finucane, Alhakami, Slovic, & Johnson, 2000; Loewenstein, Weber, Hsee, & Welch, 2001) found that affect were in fact important to risk perception. Hence, the role of affectivity/worry in regard to risk is somewhat ambiguous, and that a more specific measure of worry related to transportation risks was needed in addition to the personality measurement.

In contrast to worrying about experiencing the effect of a danger, many people are optimistic about avoiding unfortunate events. Optimism may be defined as a generalized expectancy for positive outcomes (Weinstein, 1980). Optimistic individuals tend to be optimistic about specific situations and about the skills they possess to manage these situations and are therefore less anxious. Whether someone feels that they are in control over a situation or not, may influence his or her stress level as well as their optimism in regard to the situation. Different individuals have different levels of perceived control (McKenna, 1993), which can be both real and perceived. Scheier and Carver (1985) also found a tendency for optimists to have higher self-esteem than non-optimists. Furthermore, Scheier, Weintraub and Carver (1986) found that optimists and pessimists spontaneously employ quite different coping strategies when confronted with stressful situations. Optimism was inversely correlated with focus on emotion and emotional expression, and with disengagement of the goal. In sum, it seems like optimists employ the approach to coping that in most circumstances is most adaptive and least dysfunctional (Seligman, 1990).

Optimism has been seen as a personality trait (Scheier & Carver, 1987), and can for example influence a person with a general positive attitude to be able to cope with problems. Here, driver optimism was investigated and it was regarded as more specific than a general personality trait. Since optimists expect positive outcomes their optimism have been found to influence risk behaviour. When people perceive themselves as less likely to experience something negative compared to the average person, they are more likely to engage in risk behaviour (Moen & Rundmo, 2005). Seligman (1990) found that what he labelled learned optimism consisted of three dimensions – whether a person explained events with internal, stable, and global causes or external, unstable and specific causes (e.g. Peterson & Villanova, 1988). For drivers, at least three dimensions have been regarded as important in the present study, driver self-assessment (compared to others), driver confidence and low driver stress. A positive self-assessment, as well as high driver confidence are factors that makes a person take chances (Dejoy, 1989; van der Pligt, 1996), while driver stress has

the opposite effect (Iversen, 2004). Consequently, it was hypothesized that a new measure consisting of the three factors could be used to measure driver optimism and the second aim of the paper was to look at the connection between driver optimism and personality assets, worry, attitudes, willingness to pay, and priority of safety.

As discussed above priorities are seen as behavioural intentions. Underlying intentions are attitudes and subjective norms (Armitage & Conner, 1999). Thus, attitudes are regarded as important when it comes to priority of safety. Ajzen and Fishbein (1980, 2005) have found that specific behaviours are guided largely by a reasoned action approach that assumes that the chosen behaviour follows reasonably from peoples' beliefs, attitudes, and intentions. Extensive amounts of information exist in the area of attitudes and risk behaviour (i.e. Rundmo, Hestad, & Ulleberg, 1998) and attitudes are of interest because they are thought to reflect underlying motivations, which subsequently may affect behaviour in traffic. Stated attitudes and priorities concerning safety are not necessarily accompanied by safe behaviour but knowledge about this process is still needed.

According to Lupton (1999), risks have become more globalized, less identifiable and more serious in their effects, and therefore less easily manageable and more anxiety-provoking in the last part of the twentieth century (Beck, 1992). One way of dealing with this is to pay for risk reduction. Economic theory has suggested that willingness to pay (WTP) for a future risk reduction is less than WTP for an immediate risk reduction of the same size (Alberini, Cropper, Krupnick, & Simon, 2004). This indicates that a more or less immediate danger is of advantage when investigating how much different individuals are willing to pay for a reduction of risk and also what influences this willingness. Fischer et al. (1991) found that peoples' expressed willingness to pay for future risk reductions were greater for risks that presented a direct personal threat than for risks that posed a diffuse threat to the environment or to people in general. Willingness to pay for risk reduction was hypothesised to be positively related to safety priority.

Most humans think that it is less likely that they will experience an injury than the public in general (McKenna, 1993), and this was hypothesized to be related to both attitudes about taking chances, willingness to pay to increase safety, and the priorities the respondent took in relation to risk. In these respects there will be a difference between those who think they are at risk compared to those who believe not to be at risk. Why would you be willing to pay to increase safety or prioritize safety if you did not believe to be at risk? In the present study

it was hypothesised that driver optimism would have a negative effect on priority of safety. Our attitudes about a certain event may be caused by both worry and the feelings of optimism. In addition, excitement-seeking is thought to have an effect because individuals who consciously seek risk are viewed as more likely to have a different attitude towards risk taking than individuals who do not seek out risk. As with driver optimism, attitudes were hypothesised to have a negative effect on safety priorities. Based on these studies, the final aim of the present study was to propose and test a model which aimed to describe the association between safety priority and measures of selected personality assets, worry, driver optimism, attitude, and willingness to pay.

Methods

Sample

This study was a part of the Norwegian Research Council's Risk and Safety in Transport (RISIT) programme. A questionnaire was devised to measure different personality assets as well as different assessments of transport risks. The sample was drawn by computer from the national registration office (Folkeregisteret) and 4832 mail questionnaires were distributed in the spring of 2004 to respondents between 18 and 65. The lower age limit was selected because the questionnaires included questions about drivers and their assessments. To limit the sample to the people who are most active in using means of transportation age 65 was chosen because this is when most people retire in Norway and their usage may change drastically. A follow-up was distributed in the fall of 2004 to those who had responded positively to be a part of a second study. The follow-up was conducted based for two reasons. The first and foremost was to make sure the first questionnaire was not too long and hence improve the response proportion. The second reason was that findings from the first questionnaire revealed information that was found interesting to investigate further. Of the 990 questionnaires distributed in the follow up, 510 were returned – an overall response proportion of 52 per cent. Analyses showed that the distribution of respondents was close to the distribution of the population, and that there was no difference between the individuals that had responded positively to participate in a follow up compared to those who did not want to participate. Participation in the study was voluntary, and the respondents were informed that they could omit to answer any of the questions in the questionnaire.

Questionnaire

Personality

After reviewing relevant literature (e.g. Beirness, 1993; Oltedal & Rundmo, 2006; Ulleberg & Rundmo, 2003) three personality measures were adopted and used in the study – trust, excitement-seeking, and anxiety. The chosen instrument to measure personality was the Revised Neo Personality Inventory (Costa & McCrea, 1992). A Norwegian translation (and back translation to assure the original meaning of the content) of the questions was conducted and used in the survey. High scorers on the excitement-seeking scale indicate individuals who crave excitement and stimulation. Furthermore, they like bright colours and noisy environments. Low scorers feel little need for thrill and prefer a life that high scorers might find boring (Costa & McCrea, 1992). Individuals who score high on trust have a disposition to believe that others are honest and well-intentioned. Low scorers on this scale tend to be cynical and sceptical and to assume that others may be dishonest or dangerous (Costa & McCrea, 1992). In sum, trustful individuals believe others to be basically honest and well-intending. The anxious individual is a worrier who is easily frightened. Anxious individuals are found to be apprehensive, fearful, and prone to feel worried, nervous, tense, and jittery. The scale does not measure specific fears or phobias, but high scorers are more likely to have such fears, as well as free-floating anxiety. In contrast, low scorers are calm and relaxed. They do not dwell on things that might go wrong (Costa & McCrea, 1992). A total of 24 items measured the three traits. All items were scored on five-point Likert scales ranging from strongly disagree to strongly agree (to see the questions look at Costa & McCrea, 1992)¹.

Driver self-assessment consisted of 8 items in regard to the respondents' abilities as drivers. A total of 8 items measured driver confidence, and 5 items measured driver stress (adopted from Iversen, 2004). Low scores indicated that the respondents viewed their ability and confidence as low, and low scores on driver stress indicated little driver stress. In addition, worry related to traffic were measured with 5 items (low scores= little worry), attitude were measured with 9 items (Iversen, 2004) (low score = little negative attitude), 7 items measured the

¹ A copy of the Norwegian version of the first questionnaire is available at <http://www.svt.ntnu.no/psy/bjorg.elin.moen/Q1.pdf>

respondents' willingness to pay to increase safety associated with road use (low score= little willingness to pay) and 7 items measured priorities of safety (low score= little priority of safety). The mean and standard deviation of all the questions are given in Table 1².

Statistical procedure

Personality is seen as a stable attribute and thereby the dimensions could be tested separately (Ulleberg & Rundmo, 2003). To test the internal consistency of the factors, Cronbach's alpha was used. The relationship between the variables was tested in different ways. The simplest manner was a correlational analysis where all variables were included. Thereafter, driver self-assessment, confidence, and stress were computed into a new variable called driver optimism. The mean of each dimension was used to create the new score.

Table 1.
Mean and Standard Deviation of Priority of Safety, Worry, Negative Attitudes towards Rules, Willingness to Pay, Driver Self-Assessment, Driver Confidence and Driver Stress

<i>Priority of safety</i>	Mean	SD
When I choose a mean of transportation I prioritize safety above all else	3.84	1.76
I don't want to risk my life and health by using an unsafe mean of transportation	5.36	1.84
It is my responsibility as well to say something when I see something unsafe	6.20	1.15
If safety regulations are violated when I use public means of transportation like bus or railroad, I will exit at the first possibility	4.69	1.76
I always say something when others break safety rules and regulations	3.96	1.67
I follow safety rules when I use means of transportation	5.71	1.27
It is important to emphasize safety	6.35	0.93
I understand the safety rules within transport	5.63	1.40
To choose a safe mean of transportation is important to me	5.52	1.50
<i>Worry</i>		
I become nauseated when I think about accidents	4.08	1.94
When there are a lot of accidents in transport, I become worried	4.57	1.85
When I read about accidents within transport it effects my choice of		

² A copy of the Norwegian version of the second questionnaire is available at <http://www.svt.ntnu.no/psy/bjorg.elin.moen/Q2.pdf>

transportation	3.60	1.84
I think a lot about the unforeseen events that may occur when I use different means of transportation	3.25	1.75
<i>Negative attitudes towards rules</i>		
Many safety rules must be ignored to ensure traffic flow	5.49	1.73
Sometimes it is necessary to bend the rules to ensure traffic flow	4.94	1.93
Those who take chances and break the traffic rules are not necessarily less secure than those doing everything by the book	4.56	2.02
It is acceptable to speed when other people are not involved	4.94	1.84
It is acceptable to take chances when you are the only one exposed to the risk	5.56	1.64
Safety rules are often too complicated to be carried out in real life	5.39	1.65
It is acceptable to break safety rules during transport of humans	6.62	0.95
It is acceptable to break safety rules during transport of goods	6.53	0.88
It is more important to contribute to passable conditions than to always obey the laws	5.38	1.71
<i>Willingness to pay</i>		
I am willing to pay more taxes to get safer roads	3.66	2.06
I think toll roads are acceptable if the money is earmarked expansion of the road net	4.35	2.11
More expensive train tickets are acceptable if the result is safer journeys	3.85	1.86
The safety within transport should be strengthened even though this may result in higher ticket prices	4.16	1.86
The safety on the roads should be strengthened even though this results in increased expenses for road users	4.25	1.86
It is important with campaigns directed against those in the danger zone, even if it results in higher taxes	4.16	1.81
The emergency preparedness should be improved even though this will result in higher expenses	4.94	1.70
<i>Driver self-assessment</i>		
I am a good driver compared to someone my age and with similar experience	4.92	1.38
I am a good driver compared to someone with the same gender and with similar experience	5.00	1.39
I am a good driver compared to other family members	4.73	1.57
I am a good driver compared to someone else in general	4.65	1.38
I am competent to evaluate the proper action in a complex situation	5.06	1.29
I feel safe in my role as a driver	5.66	1.29
Since I am a good driver it is acceptable to speed a little	2.70	1.65
I never loose control of the vehicle	3.99	1.76

Driver confidence:		
If I should become involved in an accident it will most likely not be my fault	4.29	1.45
I know exactly how fast I can drive and still drive safely	4.00	1.68
I never regret the decisions I make in traffic	3.64	1.62
I am always certain of the proper behaviour in traffic	4.17	1.53
I always keep calm and rational in traffic situation	4.72	1.45
I always know what to do if difficult situations occur in traffic	4.43	1.39
My driving skills are not good enough (R)	5.40	1.55
When I compare myself with other drivers I realize that I have a lot to learn (R)	4.66	1.57
Driver stress:		
As a driver I feel under constant pressure when I am in different traffic situations	2.58	1.51
I often feel pressured to make decisions without thinking them through	2.36	1.32
Situation where I am not in control happen often	2.11	1.34
Situations where I am not sufficiently acquainted with the traffic rules happens often	1.96	1.21
Disturbances often result in a loss of concentration of my driving	2.30	1.33

The respondents assessed these statements on 7 point scales of Likert type ranging from 1 = highly disagree to 7 = highly agree.

Missing value analyses were conducted and the results show that the missingness was between 0.2% and 3.6% for all of the variables. Most of them clustering around 1%. According to George and Mallery (2005) an often-used rule of thumb suggests that it is acceptable to replace up to 15 per cent of data by the mean of the distribution with little damage to the resulting outcomes. Consequently, missing data were substituted by the mean variable.

A regression analysis was conducted to investigate the relationship between the dependent and independent variables. The personality measurements were included as independent variables as well as driver optimism, worry, attitudes and willingness to pay. Safety priority was the dependent variable. Thereafter a path analysis was conducted to investigate these relationships further. The STREAMS (Structural Equation Modelling Made Simple) program was used in order to test direct and indirect effects of the different variables presented above regarding willingness to pay. SEM-analysis was used in order to compare the magnitude of the direct and indirect effects of a factor. The higher the path coefficient, the stronger is the effect that a certain variable has on another variable. Path coefficients vary from -1 to $+1$. They are

analogous to standardized partial regression coefficients. The error term, e , expresses the amount of variance which cannot be explained in the dependent variable (Gustafson & Stahl, 2000). Various fit indices were used to assess how well the path model fitted the data. The Goodness of Fit index (GFI), the adjusted goodness of fit index (AGFI), the comparative fit index (CFI), the root mean square of approximation (RMSEA) and the expected cross-validation index (ECVI). The required measures used were RMSEA <0.07 , GFI >0.90 , AGFI >0.90 , and CFI >0.90 because they indicate a close fit of the model to the data (Hu & Bentler, 1995). Furthermore, the lower the ECVI value, the better the fit (Browne & Cudeck, 1993).

Results

1 727 questionnaires were returned – an overall response proportion of 37 %. Because the response proportion was considered relatively low analyses were conducted to find response biases. These analyses showed that the distribution of respondents was close to the distribution of the population. The sample consisted of 49 per cent men and 51 per cent women. According to the National Bureau of Statistics (Statistisk Sentralbyrå - SS), the actual distribution in Norway in this age group is 50.4 and 49.6 respectively. The respondents' mean age was 41.73, and mean in the Norwegian public of people between 18 and 65 is between 40 and 41. Furthermore, 25 per cent of the respondents lived in the four largest cities in the country, and this reflects the actual distribution of the population. Consequently, the first sample was found to be representative of the Norwegian public in regard to age, gender and education as well as geographical patterns of settlement (rural vs urban areas).

In a follow-up of those who answered 'yes' to participate in another survey, 990 questionnaires were sent out and 510 were returned (response proportion 52%). t-tests showed no significant difference between subjects that answered the first or the second questionnaire in regard to risk perception and personality variables.

In the follow-up study, measurements of worry, optimism, attitude, willingness to pay, and safety priority were administered.

Table 2.

Number of items, mean scores and Cronbach's alpha for all measures

Measures	Number of items	Mean (range 1-7)	SD	Alpha α
<i>Personality variables</i>				
Anxiety	8	2.56 ¹⁾	0.74	.779
Excitement-seeking	8	2.88 ¹⁾	0.82	.792
Trust	8	3.77 ¹⁾	0.63	.709
<i>Optimism</i>				
Driver self-assessment	8	4.59	0.99	.832
Driver confidence	8	4.34	0.71	.826
Driver stress	5	2.26	0.99	.792
Worry	4	3.87	1.44	.781
Attitude	9	2.58	1.07	.843
Willingness to pay	7	4.20	1.43	.875
Priorities	9	5.25	0.91	.783

1) Range 1-5

The number of items, mean scores, and internal consistency for all measures are listed in Table 2. This includes the standardized test items used to measure personality (Costa & McCrea, 1992), and Iversen's (2004) measurement of driver confidence, worry and attitude. A measurement for priorities and willingness to pay as well as driver self-assessment and driver stress was constructed. All the reliability coefficients were acceptable.

Table 3 contains the correlations between all variables under scrutiny. The scores are based on latent variable scores for all the variables presented in Table 2. As Table 3 shows, anxious individuals had lower scores on driver self-assessment and driver confidence, and reported more stress, worry and higher priority of safety. Excitement-seekers reported higher driver self-assessment and 'bad' attitudes, and less worry, willingness to pay, and priority of safety. Trusting individuals perceived more driver stress, they were more willing to pay to increase safety, and they prioritized safety higher. It is interesting to note that both optimism and driver confidence is positively related to anxiety (but low scores -.13 and -.10 respectively). This may indicate that the anxiety trait is not important for driver self-assessment.

Table 3.
Correlation between Personality Traits, Optimism, Worry, Attitude, Priority of Safety and Willingness to Pay for Risk Reduction

	1	2	3	4	5	6	7	8	9
1.Anxiety	-								
2.Excitement		-							
-seeking	-.07**								
3.Trust	-.30**	-.12**	-						
4.Driver self-									
assessment	-.13**	.20**	-.08	-					
5.Driver									
confidence	-.10*	.07	-.04	.45**	-				
6.Driver									
stress	.27**	-.04	-.18**	-.30**	-.43**	-			
7.Worry	.32**	-.14**	-.06	-.12**	.02	.26**	-		
8.Attitudes	-.08	.27**	-.23**	.31**	-.02	.06	-.21**		
9.Willingness									
to pay	.08	-.12**	.15**	-.08	-.08	.13**	.25**	-.18**	-
10.Priority	.13**	-.26**	.11*	-.03	.19**	-.01	.48**	-.42**	.29**

**p < .01, *p < .05

Three aspects were hypothesized to be related to optimism: driver self-assessment, driver confidence and driver stress. It was hypothesised that people scoring high on the first two and low on driver stress would be more comfortable in different driving situations than those scoring low on either driver self-assessment or driver confidence, and/or high on driver stress. The correlations between these variables support this merger. Table 3 shows a correlation between driver self-assessment and driver confidence of .45, and between these two and driver stress at -.30 and -.43 respectively, which implies that these are conceptually equal. Thereafter these variables were computed in a new variable called driver optimism in the following manner (the means from Table 2 was used when computing):

$$\text{Driver optimism} = \text{driver self-assessment} + \text{driver confidence} - \text{driver stress}$$

The new variable had a mean score of 6.75 with a range from -1.60, for those who were generally low on self-assessment and confidence and high on driver stress, up to 12.63 for those scoring high on driver self-assessment and driver confidence but low on driver stress. Table 4 shows the correlation between driver optimism and the other eight variables.

Table 4.
*Correlation between Driver Optimism and Personality, Worry, Attitudes,
 Priority of Safety, and Willingness to Pay*

	Driver Optimism
1. Anxiety	-.23**
2. Excitement-seeking	.14**
3. Trust	.06
4. Worry	-.17**
5. Attitudes	.11*
6. Willingness to pay	-.13**
7. Priority of safety	.06

**p < .01, *p < .05

Compared to Table 3, this gives some additional information, but at the same time other information may be lost. E.g. driver self-assessment is related to attitudes (.31) whereas driver confidence and driver stress are not. When the variables are computed, the result is a correlation of .11. The information is more easily interpreted than Table 3 because it is only one variable to relate to compared to three. This means that those scoring high on driver optimism are more likely to score high on excitement seeking and have ‘bad’ attitudes when travelling on the roads. They are less anxious, score lower on negative worry, and they are less willing to pay to reduce the risk.

The next step was to investigate which of the independent variables were most important for priority of safety. This was done with a regression analysis. All the personality variables – trust, excitement-seeking and anxiety – were included, as well as worry, driver optimism, attitude, and willingness to pay. The results showed that the included variables gave a total explained variance of 40% and that driver worry was the most important variable. Negative attitude towards rules had a strong negative influence on safety priorities ($\beta = -.32$).

The aim of this study was to investigate the determinants of safety priorities – more specifically who prioritize safety. To achieve this aim, the relationship between the variables was investigated by means of a path model. As can be seen in Table 5 the personality variable trust did not contribute to the explained variance of priority ($\beta = 0.1$). Two models were tested, one with and one without trust. Based on the results from the regression analysis and the first path diagram trust were excluded from the second analysis. Excitement-seeking and

Table 5.
Regression Analysis of Safety Priorities

	Beta	Pearsons r	t-value
Excitement-seeking	-.13	-.26**	-3.49**
Anxiety	-.01	.13**	-0.12
Trust	.01	.11*	.32
Driver optimism	.21	.06	5.47**
Worry	.41	.48**	10.38**
Attitude	-.32	-.42**	-8.16**
Willingness to pay	.14	.29**	3.62**

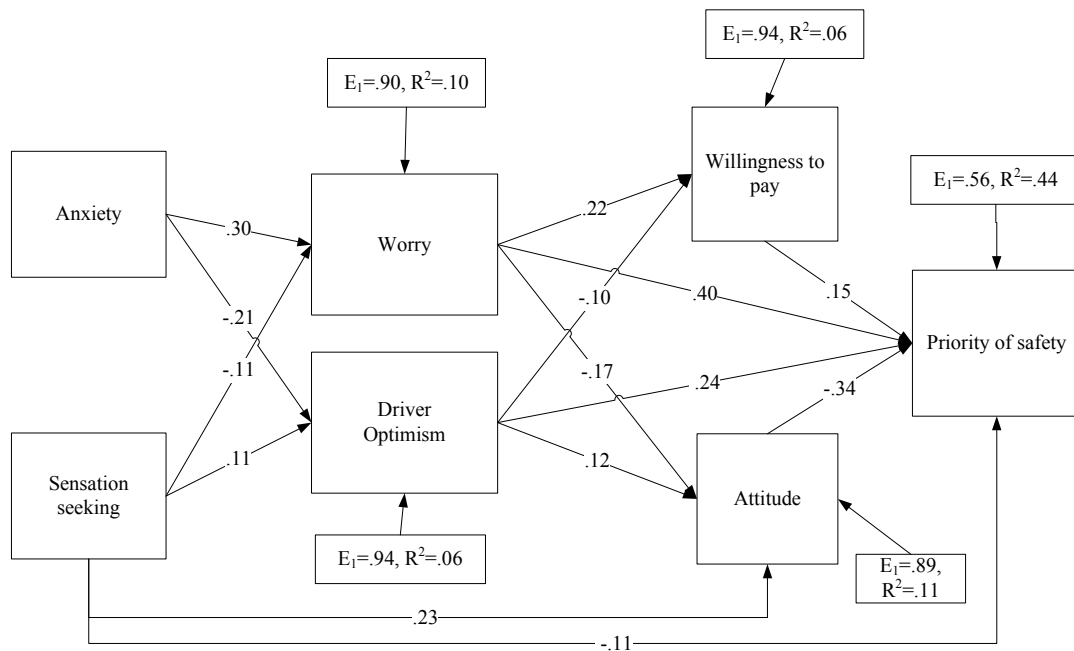
Dependent variable: safety priority

R square: .41, Adj R square: .40, **p < .01, *p < .05

anxiety were the exogenous variables, and worry, driver optimism, attitudes and willingness to pay were the mediating variables (Figure 1). Priority of safety was the dependent variable. The path model explained 44% of the variance in priority of safety. The two most important predictors are worry and attitude. As indicated by the size of the standardised path coefficients $\beta = .40$ and $-.34$ respectively, there was a considerable effect of these variables on priority of safety. Thus, the more emotional the respondent reported to be, the higher he or she prioritized safety. And if the attitudes towards traffic rules were 'bad', the respondent was more likely to have a low priority of safety.

In sum, the model adoption was considered satisfactory with an RMSEA of .053, GFI = .98, AGFI = .96, and CFI = .98. The CN (critical N) was also above 200, which is the critical value, and an ECVI of .16 means that the model can be replicated with 84% likelihood.

As seen in the model, excitement-seeking has a direct effect on priority of safety whereas anxiety does not have a direct effect. Based on the strong effect of worry on priority, lack of direct effect from anxiety on priority of safety implies that there may be an indirect effect of anxiety. In order to determine the total effects of all the variables in the model, both indirect and direct effects were computed (Table 6). The total effects demonstrate a pattern similar to the correlation analysis in Table 3.



$\chi^2 = 16.10, df = 7, N = 510, GFI = 0.98, AGFI = 0.96, CFI = 0.98, ECVI = 0.16, RMSEA = 0.053, CN = 510.57$

Figure 1. Associations between personality assets, worry, optimism, willingness to pay, attitude and priority of safety

Table 6.
Direct, Indirect, and Total Effects of the Personality Traits, Worry, and Driver Optimism on Priority of Safety

	Excitement- seeking	Anxiety	Worry	Driver optimism
Direct effect	-0.110	0.000	0.410	0.240
Indirect effects				
- through worry and WTP	-0.004	0.010		
- through worry and attitude	-0.006	0.017		
- through optimism and willingness to pay	-0.002	0.003		
- through optimism and attitude	-0.004	0.009		
- through worry	-0.044	0.120		
- through optimism	0.026	-0.050		
- willingness to pay			0.033	-0.015
- attitude			0.058	-0.041
Total effect	-0.144	0.109	0.501	0.184

As seen in Table 4, there was not a significant correlation between optimism and priorities (.06, n.s.), whereas the beta value found in the SEM analysis was .24. The explanation lies in the relationship between driver optimism and worry. When controlling for worry in a partial correlation analysis, the correlation between priority of safety and driver optimism was found to be .18 ($p < .001$). Hence, worry had a negative effect on driver optimism, which contributed to an underestimation of safety priorities.

Discussion

Traffic accidents constitute a serious problem in modern society, and millions of people die in traffic-related accidents every year. Since measures is thought to be more effective when they address and understand individual differences in beliefs and perceptions of a target group (Steg & Sievers, 2000) it is beneficial to know more about the target population. Contrary to many studies, which investigate risk perception and risk behaviour, the present study investigated what characterises those who choose what they view as the safest alternative. Several factors were found to be important to priority of safety. Three personality assets - trust, excitement-seeking and anxiety - were measured along with measurements of optimism, worry, attitudes and willingness to pay. They were all tested by factor and reliability analysis. The results were satisfactory and the measurements were used in both a regression analysis and a SEM-path analysis to predict priority of safety.

First, three personality assets were investigated. The results show that anxious individuals were found to be less trustful, to feel more worry about transport risks and to report more driver stress. Excitement-seekers on the other hand were found to have more positive self-assessments, have more negative attitudes and to prioritize safety lower. Based on the regression analysis, it was found that trust did not influence safety priority and was therefore excluded in further analyses. It was hypothesised that trust may be more important to willingness to pay for risk reduction (as the correlation of .15 in Table 3 showed). Excitement-seeking was found to have negative association with priority. This implicates that even though excitement-seekers actively seek risk for the thrill of it they are also aware of this tendency. Anxiety was not found to influence safety priorities directly (Figure 1), but an indirect relationship between the two was found through worry (Table 6). The model explained 44 per cent of the variance, and worry was found to be the most important factor.

The total effect of worry was .50 (Table 6). Worry is explained partly by anxiety and excitement-seeking, but only 10 per cent of the variance is explained by these factors.

Within risk perception unrealistic optimism, illusion of control, attribution and how these factors relate to risk perception have been studied. Table 3 showed correlations between driver self-assessment, driver confidence and driver stress and a new measurement of driver optimism was suggested and used, where these three variables were merged to one. Low values indicated little optimism and a lot of stress, whereas high scores indicated much optimism and little stress. Anxious individuals and individuals that worried about transport risks tended to score lower on driver optimism. Contrary to what was hypothesised, optimism was also positively related to priority of safety. The results showed that optimism have a direct effect of priority of safety, with a beta value of .24. The explanation may be straightforward - most people simply feel that they prioritize safety to a certain degree. In addition, optimistic people may feel confident because they prioritize safety and this creates an up-going spiral. Scheier, Weintraub and Carver (1986) found that optimists and pessimists employ different coping strategies when confronted with stressful situations. Optimists were more active in their coping strategies, and optimism was found to be inversely correlated with focus on emotion and emotional expression. This was supported by the results in Table 4, which show a correlation between worry and optimism of -.21. It seems like optimists employ the approach to coping that in most life circumstances is most adaptive and least dysfunctional (Seligman, 1990). The Attribution Style Questionnaire has been developed to look at internal vs. external explanations, stable vs. unstable explanations and global vs. specific explanations for good and bad events (Peterson & Villanova, 1988). It would be interesting to investigate how these three dimensions relate to priorities of safety as well as risk perception and risk behaviour. Learned optimism ties unrealistic optimism, illusion of control, attribution and how this relates to risk perception together. It is advisable to learn more about these joint processes together to teach individuals exposed to different hazards to perform safer. The role of driver optimism (including self-assessment) might also lead to the possibility to put drivers in front of the limits of their driver's competence (not in open traffic), and particularly drivers involved in accidents due to speeding or taxed for speeding. A simple bivariate correlation did not reveal a correlation between priority and optimism. However, the result of the partial correlation analysis showed that the effect of driver optimism on priority of safety was influenced by worry, thus this relationship should be investigated further.

Poor attitudes were found to be related to lower priorities of safety ($\beta = -.34$). This is in accordance with Ajzen and Fishbein's theory of planned behaviour (Ajzen & Fishbein, 1980), where they state that attitudes are one of three important variables in regard to behavioural intentions. Hence, influencing attitudes will also have an effect on safety priorities, and this will in turn have a positive effect on behaviour according to the theory of planned behaviour. Willingness to pay was also found to have an effect on safety priorities. Worry was found to have a positive effect on willingness to pay whereas driver optimism had a negative effect. Optimistic drivers were found to be less willing to pay for risk reduction, and they displayed negative attitudes, but they still report to prioritize safety when choosing between different options.

Here, both transport risks in general as well as individual driver assessments were measured and a further separation of the two may provide more information. As has been discussed in the present paper as well as many others, there is a difference in the perception of controllable and uncontrollable risk sources and therefore further studies will benefit from a clearer distinction of the two dimensions. Even though this may be regarded as a shortcoming increased knowledge about what influences priorities is important to improve the ability to influence peoples' priorities and subsequently increase safety. In the present study worry related to transport risk was found to be the most important determinant of safety priorities. This means that when programs are designed in order to improve safety, they should take into consideration the worry that people feel when they travel. One potential problem is that there is a fine line between getting those who do not worry to worry more and hereby increasing safety, and frightening those who are already worried. In addition, the measure of driver optimism seems promising and further research will gain from investigating this further.

References

- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179-211.
- Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior*. New Jersey: Prentice-Hall, Inc. Englewood Cliffs.
- Ajzen, I., & Fishbein, M. (2005). The influence of attitudes on behavior. In D. Albarracín, B. T. Johnson & M. P. Zanna (Eds.), *The Handbook of Attitudes* (pp. 173-221). Mahwah, NJ: Lawrence Erlbaum Associates.

- Alberini, A., Cropper, M., Krupnick, A., & Simon, N. B. (2004). *Willingness to pay for mortality risk reductions: Does latency matter?* Washington: Resources for the Future. Document Number)
- Armitage, C. J., & Conner, M. (1999). The theory of planned behaviour: Assessment of predictive validity and 'perceived control'. *British Journal of Social Psychology*, 38, 35-54.
- Arnett, J. J., Offer, D., & Fine, M. A. (1997). Reckless driving in adolescence: 'State' and 'trait' factors. *Accident Analysis and Prevention*, 29(1), 57-63.
- Barnett, J., & Breakwell, G. M. (2001). Risk perception and experience: Hazard personality profiles and individual differences. *Risk Analysis*, 21(1), 171-177.
- Beck, U. (1992). *Risk society: Towards a new modernity*. London: Sage.
- Beirness, D. J. (1993). Do we really drive as we live? The role of personality factors in road crashes. *Alcohol, Drugs and Driving*, 9(3-4), 129-143.
- Berry, D. C. (2004). *Risk, communication and health psychology*. Maidenhead: Open University.
- Bouyer, M., Bagdassarian, S., Chaabanne, S., & Mullet, E. (2001). Personality correlates of risk perception. *Risk Analysis*, 21(3), 457-465.
- Browne, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In J. S. Long & K. A. Bollen (Eds.), *Testing structural equation models* (pp. 137-162). Newbury Park, CA: Sage.
- Carver, C. S., & Scheier, M. (2000). *Perspectives on personality* (4th ed.). Boston: Allyn and Bacon.
- Costa, P. T., & McCrea, R. R. (1992). *Revised NEO personality inventory (NEO PI-R) and NEO five-factor inventory (NEO-FFI) professional manual*. Odessa, FL: Psychological Assessment Resources Inc.
- Dejoy, D. M. (1989). The optimism bias and traffic accident risk perception. *Accident Analysis & Prevention*, 21(4), 333-340.
- Finucane, M. L., Alhakami, A., Slovic, P., & Johnson, S. M. (2000). The affect heuristic in judgments of risks and benefits. *Journal of Behavioral Decision Making*, 13, 1-17.
- Fischer, G. W., Morgan, M. G., Fischhoff, B., Nair, I., & Lave, L. B. (1991). What risks are people concerned about. *Risk Analysis*, 11(2), 303-314.
- George, D., & Mallery, P. (2005). *SPSS for Windows step by step. A simple guide and reference. 12.0 Update*. Boston: Pearson Education.
- Gustafson, J., & Stahl, P. A. (2000). *STREAMS user's guide. Version 2.5 for Windows*. Mölndal: Multivariate Ware.
- Hu, L., & Bentler, P. M. (1995). Evaluating model fit. In R. H. Houle (Ed.), *Structural Equation Modelling: Concepts, Issues and Applications* (pp. 76-99). London: Sage Publications.
- Iversen, H. (2004). Associations between driver stress, locus of control and reported risk behaviour in traffic. *Psychology*.
- Iversen, H., & Rundmo, T. (2002). Environmental concern and environmental behaviour among the Norwegian public. *Journal of Risk Research*, 5(3), 265-279.

- Jonah, B. A. (1997). Sensation seeking and risky driving: A review and synthesis of the literature. *Accident Analysis and Prevention*, 29(5), 651-665.
- Jonah, B. A., Thiessen, R., & Au-Yeung, E. (2001). Sensation seeking, risky driving and behavioral adaptation. *Accident Analysis and Prevention*, 33(5), 679-684.
- Loewenstein, G. F., Weber, E. U., Hsee, C. K., & Welch, N. (2001). Risk as feelings. *Psychological Bulletin*, 127(2), 267-286.
- Lupton, D. (1999). *Risk*. London New York: Routledge.
- McKenna, F. P. (1983). Accident proneness: a conceptual analysis. *Accident Analysis & Prevention*, 15(1), 65-71.
- McKenna, F. P. (1993). It won't happen to me: Unrealistic optimism or illusion of control? *British Journal of Psychology*, 84(1), 39-50.
- Moen, B. E., & Rundmo, T. (2005). Predictors of unrealistic optimism: A study of Norwegian risk takers. *Journal of Risk Research*, 8(5), 363-382.
- Olstedal, S., & Rundmo, T. (2006). The effects of personality and gender on risky driving behaviour and accident involvement. *Safety Science* 44(7), 621-628.
- Peterson, C., & Villanova, P. (1988). An Expanded Attributional Style Questionnaire. *Journal of Abnormal Psychology*, 97(1), 87-89.
- Rundmo, T., Hestad, H., & Ulleberg, P. (1998). Organizational factors, safety attitudes and workload among offshore oil personnel. *Safety Science*, 29, 75-87.
- Rundmo, T., & Iversen, H. (2004). Risk perception and driving behaviour among adolescents in two Norwegian counties before and after a traffic safety campaign. *Safety Science*, 42, 1-21.
- Scheier, M. F., & Carver, C. S. (1985). Optimism, Coping, and Health - Assessment and Implications of Generalized Outcome Expectancies. *Health Psychology*, 4(3), 219-247.
- Scheier, M. F., & Carver, C. S. (1987). Dispositional Optimism and Physical Well-Being - the Influence of Generalized Outcome Expectancies on Health. *Journal of Personality*, 55(2), 169-210.
- Scheier, M. F., Weintraub, J. K., & Carver, C. S. (1986). Coping with Stress - Divergent Strategies of Optimists and Pessimists. *Journal of Personality and Social Psychology*, 51(6), 1257-1264.
- Seligman, M. P. (1990). *Learned Optimism. How to change your mind and your life*. New York: Pocket Books.
- Sjöberg, L. (2006). Will the real meaning of affect please stand up? *Journal of Risk Research*, 9(2), 101-108.
- Slovic, P., Flynn, J. H., & Layman, M. (1991). Perceived risk, trust, and the politics of nuclear waste. *Science*, 254, 1603-1607.
- Steg, L., & Sievers, I. (2000). Cultural theory and individual perceptions of environmental risks. *Environment and Behavior*, 32(2), 250-269.
- Ulleberg, P., & Rundmo, T. (2002). Risk-taking attitudes among young drivers: The psychometric qualities and dimensionality of an instrument to

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- measure young drivers' risk-taking attitudes. *Scandinavian Journal of Psychology*, 43(3), 227-237.
- Ulleberg, P., & Rundmo, T. (2003). Personality, attitudes and risk perception as predictors of risky driving behaviour among young drivers. *Safety Science*, 41(5), 427-443.
- van der Pligt, J. (1996). *Perceived risk, comparative optimism and behaviour*. Paper presented at the Contemporary psychology in Europe: Theory, research, and applications: Proceedings of the IVth European Congress of Psychology, Seattle.
- Weinstein, N. D. (1980). Unrealistic optimism about future life events. *Journal of Personality and Social Psychology*, 39(5), 806-820.

Applying the risk-as-feelings framework to explain demand for risk mitigation

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Abstract

The main aim of this study was to investigate whether the risk-as-feelings perspective could be applied as a theoretical framework in order to explain demands for risk mitigation. Priorities were also studied because they were seen as the manifest results of risk judgement in regard to mitigation demands. The results are based on questionnaire surveys to a representative sample of the Norwegian public ($n = 510$). A structural equation modelling analysis was performed in order to achieve the aim of the study, and the results showed that the risk-as-feelings framework explained up to 52 per cent of the variance in risk mitigation demands and 55 per cent of the variance in general risk assessment. It is concluded that both probability assessment and consequence evaluation are important to cognitive risk assessment, and that intentions to prioritize safety are important to demand for risk mitigation.

KEY WORDS: Risk-as-feelings; demand for risk mitigation; priorities

Introduction

Many different types of risks surround people in everyday life. Important information can be provided if one understands the processes of how these risks are perceived. Sjöberg (1999) argued that risk perception is studied largely because it is believed that perceived risk is a clue to policy demands. Different models have been proposed to understand the process of risk perception and policy demands. The latter is related to decisions and decision-making under risk, and has been a central topic of decision-theory. In regard to risk

perception, emotions and feelings have been scrutinized, but according to Loewenstein et al. (2001), the decision-theoretical approach to decision-making under risk has largely ignored the role played by emotions. The primary goal of this study was to test if the risk-as-feelings framework (Loewenstein et al., 2001) could be applied in order to explain demand for risk mitigation in transport. It is important to note that the risk-as-feelings perspective refers to the actual model whereas the risk-as-feelings framework refers the usage of the theoretical framework and not the original model.

Of the risk sources most often put under scrutiny, three main areas have been studied – environmental, health and traffic risks. These studies have found somewhat different results, and different types of risk evaluation have been found. When it comes to health-protective behaviour, much research has been conducted, and several models have been presented. Among these models are the social cognition model (Ajzen & Fishbein, 1980), the consequentialist model and the risk-as-feelings perspective (Loewenstein et al., 2001). Few, if any, attempts have been made to explain demand for risk mitigation applying these models. The role of feelings in regard to mitigation demands is also uncertain, but health-protective behaviour is believed to be reflected in priorities because individuals concerned about their health are also assumed to prioritize safety.

The knowledge about different kinds of risk varies over time and between people. Therefore, a common and well known risk source was chosen, namely risks related to transportation. Transport may be regarded as a more unambiguous risk source than many others. The consequences are mostly known to both lay people and scientists, there are few delayed effects, the risk is more or less voluntary, there is little chronic potential (that we know of) because most accidents have an immediate and not a delayed effect, and most people have – to a certain extent – learned to live with the risk. Overall, most people are familiar with the potential risks associated with different means of transportation, and hence, they do not have to assess the danger associated with more or less unknown risk sources. Additionally, even though private transportation may be fatal for the individual, it hardly has big consequences compared to a nuclear accident for instance. Hence, associated negative feelings towards the risk source were believed to be lower.

Predictors of risk perception

Risk perception refers to an individual's intuitive judgement of two aspects of risk: the probability of occurrence and the severity of the associated consequences. Which of these factors are most important when assessing risk were discussed by Slovic (1999) and Sjöberg (1999). In addition, risk perception is probably dependent on intuitive thinking guided by emotional and affective processes, and feelings of worry when thinking about risk may alter the judgement of risk (Rundmo, 2002). Therefore, perceived risk is thought to include affectivity related to the activity, and this discussion indicates a difference between the cognitive assessment of risk and the affective reaction when thinking about, or experiencing, risk. Cognition is seen as the act or process of knowing, including both awareness and judgement. Feelings, however, were defined by the Merriam-Webster dictionary (<http://www.m-w.com/netdict.htm>) to be a synonym of emotion and the affective aspects of consciousness. Hence, cognitive risk evaluation may be seen as a down-to-earth evaluation of a risk source, whereas affective evaluation is more dependent on emotion.

The effect of affect in different situations has been discussed in different areas. Zajonc discussed how feeling influenced our thinking in 1980. The risk-as-feelings perspective was developed by Loewenstein et al. (2001), and refers to our fast, instinctive, and intuitive reactions to danger. It was primarily developed to incorporate the fact that the emotions people experience at the time of making a decision influence their eventual decision. The model is based on a number of premises, each of which is well supported (Lucey & Dowling, 2005). The model emphasizes seven areas. In addition to feelings, the term risk perception contains the first two aspects of the risk-as-feelings perspective, namely anticipated outcomes and subjective probability. There are several differences between the risk-as-feelings perspective and the consequentialist perspective. One is that Loewenstein et al. (2001) included a variable called 'other factors', (e.g. vividness, immediacy, and background mood), and a second is that the consequentialists view feelings only as direct effects of cognitive evaluation and not associated with any of the other variables. Other factors can be viewed in light of dread factors present in the psychometric paradigm (Fischhoff, Slovic, Lichtenstein, Read, & Combs, 1978), and according to the risk-as-feelings perspective, other factors only have an effect on feelings. However, the dread risk component has been found most influential

in risk perception (Boholm, 1998; Brun, 1992; Vlek & Stallen, 1981), and this factor was excluded from the present study.

Affect provides information when processing events and recalling previous information. People will be influenced by their feelings when they assess a risk source. Consequently, feelings may be just as important as people's assessment of both probability and consequences. Rundmo (2002) suggests that to the extent that perceived risk is related to affectivity, it is the particular aspects of worry and concern that are influential. Furthermore, he concluded that the affective component in risk perception is expressed as a feeling of worry and uncertainty. It is argued that even though worry is a risk-related feeling (Kobbeltvedt, Brun, Johansen, & Eid, 2005), different studies have found feeling only to be modestly related to perceived risk (i.e. Drottz-Sjöberg & Sjöberg, 1990; Sjöberg, 1998). Therefore, it is assumed that feelings (as understood by Loewenstein et al. (2001)) are something more than merely worry.

Worry is defined as 'mental distress or agitation resulting from concern usually for something impending or anticipated' in the Merriam Webster dictionary. Rundmo (2002) implied that when concerned about a hazard, thinking about it may evoke worry, and hence thinking about a risk source was hypothesized to be a variable that was important to the feeling dimension. Stigmatization is based upon negative imagery that has become associated with places, products, technologies and, of course, people (Flynn, Slovic, & Kunreuther, 2001). According to Gregory and Satterfield (2002), most work on stigma has 'emphasized experts' capability to manage the associated impacts based on fiscal, morbidity, and mortality estimates, with less attention given to the affective or ethical dimensions. As a result, 'associated risk is typically viewed as an isolated phenomenon rather than a defining or encapsulating experience; as something to be mitigated or compensated for rather than something that is experienced over time and demands social management on an ongoing basis'(p. 349). When something is stigmatized, it makes it easier for people to know that it is a negative 'thing', and therefore they have easy access to negative information and may try to avoid it. Supporting evidence was provided by the affect heuristic (Finucane, Alhakami, Slovic, & Johnson, 2000), which states that the importance of affect should be emphasized in risk judgements. Consequently, the degree of negativity associated with the different transport risks was also included as a feeling in addition to worry and thinking about risk. Here, feelings are hypothesized to consist of three components: worry, negative association, and thinking about a risk source.

Both the risk-as-feelings and the consequentialist frameworks were tested with the current data. In addition, studies have found that probability is related to risk assessment whereas consequence is important for risk mitigation (Sjöberg, 1999). Therefore, it is regarded as reasonable to investigate a third model, which includes a direct effect of consequences on demand for risk mitigation as well as the indirect effect.

In sum, feelings and affectivity are interesting because they have been found important in risk perception. Furthermore, it is assumed that cognitive evaluations and feelings are important predictors of behaviour, as the risk-as-feelings perspective postulates. It is assumed that people make a conscious decision based on these two factors. However, to predict behaviour is not simple, and respondents have been found to be biased when reporting their behaviour (Lajunen & Summala, 1995). Therefore, other factors than behaviour may be considered in order to reveal additional information about mitigation demands. One such factor is priority. Priority may be seen as a preferential rating. It is also something that is meriting or given attention before competing alternatives.

Priority of safety

The existing studies with reference to priorities include mostly priorities in relation to decisions which companies carry out. According to a report from TemaNord (2003), in many studies priority of safety versus other production goals stand out as a principal component of safety climate. Priority of safety has most often been linked to and investigated as important in regard to the priorities made by companies or governments. Few, if any, studies have looked at the importance of the priority that individuals express. Priority of safety may be seen as the manifest result of both feelings about risk and perception of risk. One may assume that regardless of the background of the priorities, they will have an effect on demand for risk mitigation because if we do not prioritize safety, there will be no demand for reducing risk.

Transportation accidents may have extreme consequences, but when people perceive the risk involving transport, this risk may not elicit a higher priority of safety in most people. Perhaps these accidents have become so common that people are simply habituated to them? In addition, protective mechanisms such as unrealistic optimism (van der Pligt, Otten, Richard, & van der Velde, 1992) or illusion of control (Langer, 1975) can protect individuals

from worrying too much, and might also contribute to less priority of safety. Some studies have found that a potential effect of fear and anxiety on various types of judgements tend to go in favour of cautious, risk-averse decision-making. In addition, theories of unrealistic optimism and illusion of control may imply that people may assess a certain risk as high, but they think that an accident is unlikely to happen to them and therefore fail to prioritize safety. Another important factor in this regard is fatalism. Some people may evaluate a risk as high and still fail to prioritize safety because they do not believe that they have the ability to decrease the risk level. Taking previous research of risk into account, the relationship between general risk assessment and priorities and the relationship between risk assessment and demand for risk mitigation is not clear, and no hypothesis about this relationship was made prior to the analyses.

A feeling does not have to be cognitively mediated, and a considerable part of affectivity is expected to be linked to the actual experience of danger and cannot be measured by a questionnaire. Nevertheless, the affectivity we feel when thinking about and assessing risk is regarded as important. Feelings were hypothesised to effect priority of safety. Research of Myers, Henderson-King and Henderson-King (1997) found perceived risk and worry predicted the desire for regulations and also the willingness to take action in order to decrease the risk associated with technological hazards. Furthermore, they showed that worry was related to personal action to reduce risk as well as a desire for risk regulation ($\beta = .23$). Worry has been found to be influenced by cognitive judgement of risk and also to be the most significant predictor variable in explaining differences in individual desire for action and priority of risk reduction measures (Baron, Hershey, & Kunreuther, 2000).

Demand for risk mitigation

Demand for mitigation is seen as the outcome of a decision-making process. When a risk is perceived to high and the individual has decided to prioritize risk, this will influence the desire to mitigate risk. Studies about this relationship have been conducted earlier, and Sjöberg (1999) found level of perceived risk to be related to the probability of harm or injury, whilst demand for risk mitigation was related mostly to the expected severity of consequences, should harm occur. According to Sjöberg (1999), the demand for reducing risk is clearly driven by severity of consequences, not by probability of risk. Following the risk-as-feelings framework, this paper will investigate the effect of both consequences

and probability in regard to cognitive evaluation of risk. In addition, the mutual relationship between cognitive risk assessment and feelings will be investigated because risk may be seen as an evaluation of both cognitive components and of feelings.

Differences due to gender, age, and education

Many studies have examined the effect of gender differences on traffic risks, environmental and health risks (e.g. Byrnes, Miller, & Schafer, 1999; DeJoy, 1992; Flynn, Slovic, & Mertz, 1994; Glendon, Dorn, Davis, Matthews, & Taylor, 1996; Greenberg & Schneider, 1995; Gustafson, 1998). Studies have also shown that people differ in their use of the risk term, and men as well as experts have been found to stress probability whereas women and lay-people have been found to stress consequences (Drottz-Sjöberg & Sjöberg, 1991). According to Loewenstein (2001), a 'large number of studies have found that male individuals tend to be more risk averse than female individuals' (p. 280), and refer to Byrnes et al. (1999). In the referenced article, the authors conclude that their results 'clearly support the idea that male participants are more likely to take risks than female participants' (p. 377).

Loewenstein concluded that further studies are needed in order to determine whether observed differences in risk-taking may be mediated by differences in emotional reactions to risks. Hence it may be interesting to look at the effect of gender in regard to feeling, priority and demand for risk mitigation. Consequently, an additional hypothesis was that women demand more risk reduction than men, older subjects desire more risk mitigation than younger subjects, and respondents with a high level of education will perceive risk as lower than subjects with less education. It is appropriate to extend the model and take age, gender, and education into account to investigate if this gives additional information.

Method

Sample

To achieve the aims of the study, a questionnaire was distributed to a representative sample of the Norwegian public. The sample was drawn by computer from the national registration office (Folkeregisteret) and a mail questionnaire was distributed in the spring of 2004. A follow-up was distributed in the autumn of 2004. Of the 990 questionnaires distributed in the follow up, 510 were returned – an overall response rate of 52 per cent. Analyses showed that the distribution of respondents was close to the distribution of the population. The sample consisted of 49 per cent men and 51 per cent women, and according to the Statistics Norway (SSB), the actual distribution is 50.4 and 49.6. The respondents' mean age was 41.73, and mean in the Norwegian public of people between 18 and 65 is between 40 and 41. Furthermore, 25 per cent of the respondents were from the four largest cities in the country, and reflect the actual distribution of the population.

Questionnaire

The aim of the questionnaire was to gain information about different assessments thought to influence risk perception, as well as demographic variables. The subjects were asked to rate five transport risks: using a car, motorcycle, scooter, bike, and walking (pedestrian). The dimensions studied were: (1) probability of harm; (2) assessment of consequences; (3) how worried they were when they thought about risks; (4) general risk assessment; (5) how much they thought about the risk; (6) if they associated anything negative with the mean of transportation; (7) how highly they prioritized safety when they chose different means of transportation, and (8) how important it was for them that the risk was reduced (risk mitigation). All risks were rated on a 7 point scale of the Likert type (the questions are displayed in the Appendix). All scales were category scales. 1 was defined as low probability, low consequences, little demand for risk mitigation, and so on, whereas 7 was defined as high probability, high consequences, and so on. In addition, information about demographic variables of gender, age, education, and whether they were exposed to risk through work, was also collected.

Participation in the study was voluntary, and the respondents were informed that they could omit to answer any question in the questionnaire.

Statistical procedures

Risk perception was operationally defined as the level of risk which respondents perceive and report on rating scales of risk. To enhance interpretability of the results, Cronbach's (1951) alpha coefficient was applied to appraise homogeneity of the items within the different means of transportation. Although a measure cannot be too reliable, as a rule, reliability coefficients round 0.7 and above are professionally acceptable (Nunnally, 1978).

The relationship between risk assessments, priority and demand for mitigation were estimated using structural equation modelling. This analysis was done by means of the STREAMS programme (STRuctural Equation Modelling made Simple) (Gustafson & Stahl, 2000). Path coefficients vary from -1 to +1, and one may compare the magnitude of the direct and indirect effects of a factor. The higher the path coefficient, the stronger is the effect that a certain variable has on another variable. They are analogous to standardised partial regression coefficients. The error term, e , expresses the amount of variance which cannot be explained in the dependent variable. Various fit indices were applied to test how well the path model fitted the data. The goodness-of-fit index (GFI), the adjusted goodness-of-fit index (AGFI), the comparative fit index (CFI), and the root mean square of approximation (RMSEA) were applied. An RMSEA below .05 suggests close fit, while values up to .08 suggest acceptable fit (Browne & Cudeck, 1993). The required levels of the other measures are GFI .90, AGFI .90, and CFI .90 (see Berry, 1993 for a more detailed description of the regression assumptions).

Results

To investigate the reliability of the factors for personal transportation, Cronbachs alpha and total inter item were used and the results showed that these were satisfactory (see Table 1).

Table 1.

Number of Items, Mean Scores, and Cronbach's Alpha for Probability, Consequence, Worry, and Risk Perception

Measures	Nr. of items	Mean (range 1-7)	Alpha α	Total Corrected Inter Item
Probability	5	3.71 (1.28)	.811	.60
Consequence	5	4.84 (1.08)	.823	.62
Worry	5	2.93 (1.40)	.880	.71
Thinking about	5	3.40 (1.40)	.861	.68
Stigma	5	2.90 (1.22)	.808	.60
Priority	5	5.25 (1.52)	.908	.77
Risk Perception	5	3.83 (1.13)	.848	.65
Demand for risk mitigation	5	5.66 (1.55)	.920	.80

To simplify the correlation matrix, latent variable scores were computed for probability assessment, consequence evaluation, worry, thinking about risk, negativity associated with the risk source (stigma), general risk, priority of safety, and demand for risk mitigation. Table 2 shows that the correlations between the variables. General risk assessment for private transportation was found to be highly correlated with worry, probability, and thinking about risk ($r=.59$, $.58$ and $.51$ respectively). That is, people inclined to rate the general risk as high were also more likely to rate the probability of an accident to occur as high, they reported that to think more about risk, and was also more worried about experiencing an accident.

To investigate whether the risk-as-feeling framework was suitable for predicting demand for risk mitigation, a structural equation modelling analysis was conducted. The assessed consequences of an accident were used as anticipatory outcomes, and the probability assessment as subjective probability. General risk assessment was used as their cognitive evaluation, and feelings

consisted of worry, thinking about risk, and negative associations (stigma). How highly the subjects rated priority of safety was thought to be the manifest result of risk assessment, therefore, this factor was used as a substitute of risk behaviour because if people report their priorities truthfully this would reflect actual behaviour. Demand for risk mitigation was the dependent variable in the model.

Table 2.

Correlations between Risk Assessments, Priority, and Demand for Mitigation (personal risk)

	1	2	3	4	5	6	7
1. Probability							
2. Consequence	.29**						
3. Worry	.48**	.36**					
4. Think about	.45**	.30**	.64**				
5. Stigma	.27**	.13**	.48**	.40**			
6. General risk	.58**	.39**	.59**	.51**	.35**		
7. Priority	.13**	.21**	.22**	.25**	.06	.09*	
8. Mitigation demands	.14**	.31**	.20**	.23**	.12**	.17**	.50**

** p< 0.01, *p< 0.05, N=510

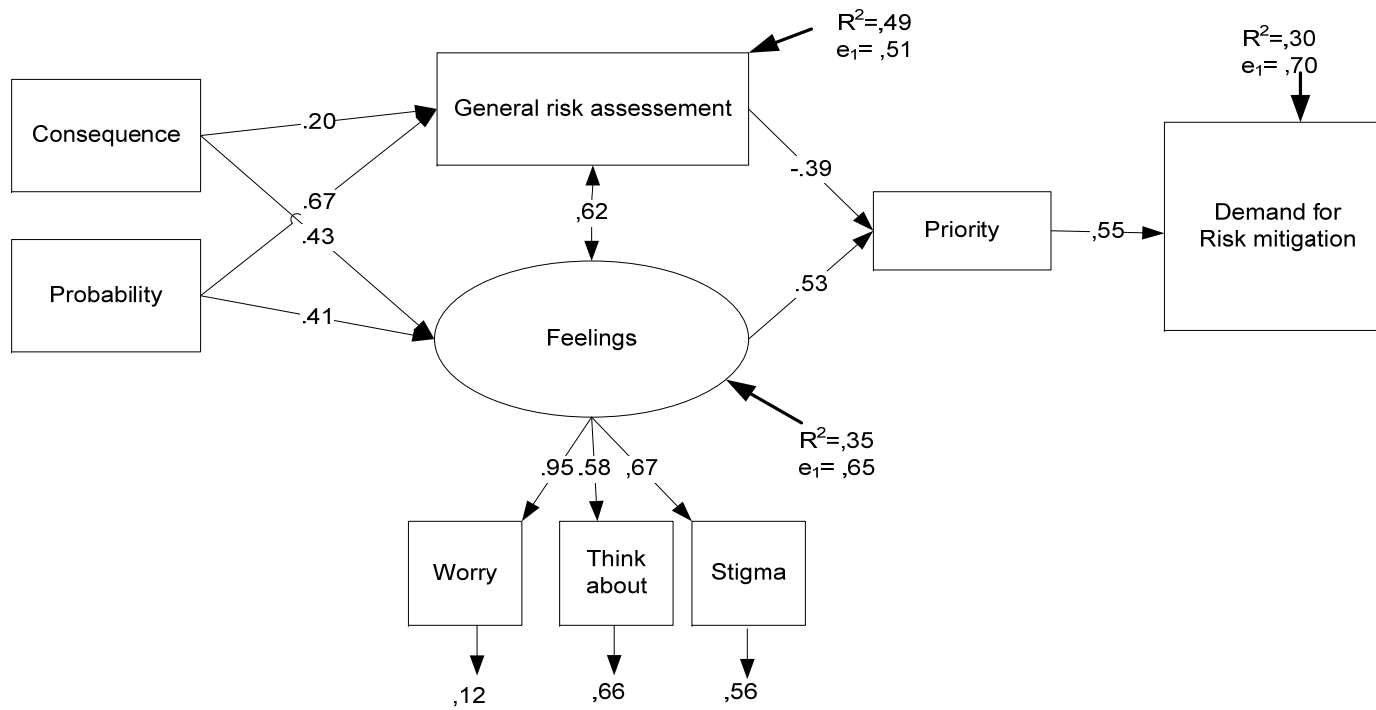
STREAMS was applied to explore the relationship between the variables proposed to be important to feelings and general risk assessment in the risk-as-feelings perspective. Furthermore, these measurements were used to investigate the hypothesized effect of probability and consequences on general risk assessment and feelings.

The SEM path model explained 49% of the total variance in general risk assessment, 35% of feelings, and 30% of the total variance in demand for risk mitigation (see Figure 1). According to the risk-as-feelings perspective, general risk assessment and feelings would have an effect on behaviour, and behaviour would have an effect on outcomes. The present model showed that feelings were more closely related to priority than general risk assessments. In fact, general risk assessment had a negative effect on priority (-.39). The covariance between feelings and general risk assessment was 0.62.

As indicated by the size of the standardized path coefficient, there was an effect of both consequence and probability on general risk assessment (β =

.20 and .67 respectively) and feelings ($\beta = .43$ and $.41$ respectively), showing that probability assessments had a larger effect on general risk assessment than consequences. This is in accordance with results reported by Sjöberg (1999). The effect of consequence evaluation on feelings was slightly higher than the effect of probability assessments on feelings. Of the three variables included in the confirmatory factor analysis of feelings, worry was found to be the most important variable with a factor loading of .95.

Furthermore, the model showed that feelings had a higher effect on priority than general risk assessment, and that priority had an effect on demand for risk mitigation ($\beta = .55$). Thus, the more one experiences feelings in regard to a risk, the more one prioritizes safety and the more one demands risk mitigation. The relationship between general risk assessment and priority demonstrates that individuals scoring high on general risk assessment reported a lower level of safety priority compared to those who assessed risk as low. General risk assessment was only weakly related to demand for mitigation. This finding suggests that general risk assessment is not important in regard to demand for risk mitigation. The model fit measurements indicated that the model fitted the data with a RMSEA = .056, CFI = .99, GFI = .93 and AGFI = .85. In sum, the model fit was considered satisfactory.



RMSEA=.056, CN=112.5, CFI=.99, GFI=.93, AGFI=.85

Figure 1. Path diagram of the relationship between risk assessments, feelings, priority, and demand for risk mitigation (personal risk)

Age, gender, education and exposure to risk have been found to influence risk assessment, feelings and demand for mitigation. Therefore, these variables were included in a second STREAMS analysis (Table 3). Compared to the model above, this model explained more of the total variance in both demand for risk mitigation (52%), feelings (43%), and general risk assessment (55%). The negative effect of gender shown in the table means that females had more feelings of worry and concern about risk, they assessed the general risk as higher, and they prioritized safety more. Gender had the highest effect on priorities compared to the other two demographic variables. Age had the largest effect on demand for risk mitigation; older respondents demanded more risk reduction than younger respondents. Education had the most significant effect on feelings. Higher education was associated with more feelings than low education. Risk exposure had the highest effect on risk mitigation. This model fit measurements indicated of RMSEA= .029, CFI = .99, and GFI= .91, which was somewhat lower than the first model, but in sum, the model fit was considered satisfactory.

Two more analyses were conducted in order to investigate the role of consequences in regard to risk mitigation demands. A direct effect of consequences on demand for risk mitigation was investigated in accordance with Sjöberg's (1999) findings about consequences having an effect on mitigation demands. The Beta was .22, and the model fit stayed equally satisfactory. The R^2 rose to 40%, in contrast to the first analyses, where the R^2 was 37%. Therefore, a direct effect of consequences was found on demand for risk mitigation, but not an effect working through cognitive risk assessment. In a fourth analysis, the direct effect of consequences on cognitive risk evaluation was removed while the effect on risk mitigation demands was kept. This resulted in a poorer model which was rejected (RMSEA = .11, CFI = .94, and AGFI = .80).

Table 3.

Path Diagram of the Relationship between Risk Assessments, Feelings, Priority, and Demand for Risk Mitigation. Gender, Age and Education

		<i>e</i>	Feelings	General risk assessment	Priority	Mitigation
Worry	.92	.16		.73		
Think about	.58	.66				
Stigma	.67	.56				
Probability			.37	.66	-	-
Consequence			.43	.20	-	-
Feelings			α	α	.49	.24
General risk assessm			-	-	-.37	.07
Priority			-		α	.44
Gender			-.07	-.07	-.20	.05
Age			-.09	-.11	-.02	.31
Education			.27	.24	-.15	-.15
Exposure			.17	-.02	.10	.25
E			.57	.45	.78	.48
R ²			.43	.55	.22	.52

RMSEA= .029, CN=101.79, CFI=.99, GFI=.91, AGFI=.82

Discussion

The goal of the present paper was to investigate the applicability of the risk-as-feelings framework to explain demand for risk mitigation in transport. As shown in Table 3, the model explained 52% of the variance in demand for risk mitigation and 55% of the variance in general risk assessment. Overall, probability had a higher effect on general risk assessment than consequences whereas consequences had a higher effect on feelings. This is in accordance with Finucane et al. (2000), who proposed that people use affect heuristic to make judgements, and this was also judged as easier than weighing pros and cons or retrieving examples from memory. Priority was found to be the most important predictor regarding demand for mitigation. Feelings also had an effect on mitigation demands whereas cognitive risk assessment did not.

In his 1999 study, Sjöberg found that risk was almost synonymous with probability. The present study also found a high correlation between risk and

probability, but general risk assessment and worry were correlated at approximately the same level. The correlation between probability and worry was higher than the correlation between consequences and worry. When these variables were investigated in view of the risk-as-feelings framework and with the help of a path model, it showed that probability had a higher effect on general risk than it had on feelings. Furthermore, probability was more important than consequences in regard to general risk, whereas the opposite was true with regard to feelings. Sjöberg (1999) also argued that perceived risk is a poor guide to policy makers about risk mitigation demands. This was confirmed in the present study, where the effect on perceived risk was found to be low ($\beta=.07$) in both analyses. Support can also be found in a study by Ulleberg and Rundmo (2003), who found little or no relationship between risk perception and risky driving behaviour.

According to Loewenstein et al. (2001), people's emotional reaction to risks depend on several factors such as vividness, personal exposure and past history of conditioning. Here, negativity associated with an object or event – stigma – may provide one potential explanation of the effect of feelings compared to cognitive assessment. This possibility was also investigated by Damasio (1994), who found that vividness of outcomes was one of the most important determinants of emotional reactions to future outcomes. In addition, Hsee and Weber (1997) found that the effect of faulty risk perception will decrease if the person in comparison is vivid in the respondents mind. Differences in peoples' self-reported ability to form mental images have been found to correlate with visceral (e.g. fear, anxiety, dread) responses (Loewenstein et al., 2001). Consistent with this idea, Miller et al. (1987) reported that individuals' ability to form vivid images could be enhanced through training, and that this training increased their visceral response to personalized scripts designed to elicit particular affective reactions, such as anger and fear. These findings can be linked to stigmatization and amplify the role of feelings in regard to risk perception, priority of safety and demand for risk mitigation.

The correlation (Table 2) between risk assessment and priorities was low (0.06, n.s.), and the path model (Figure 1) showed a negative effect from risk assessment to priorities. At least three possible explanations may be offered for this negative association. The first is that many people are sensation-seekers, and therefore they do not prioritize safety even if they regard the risk as high. A second explanation may stem from the theory of unrealistic optimism (McKenna, 1993;

Weinstein, 1980, 1982). The theory states that people are unrealistic when they think about the possibility of experiencing the effect of a danger. Therefore, they may perceive the general risk as high, but fail to prioritize safety because they regard it as unlikely that they will experience the danger. The third explanation may be that there is a loop effect. It may be argued that if one regards a risk as high and starts to prioritize safety, one also (most likely correctly) will start to regard the risk as lower. A study of the change in cognitive risk assessment and priority may benefit from a longitudinal approach.

Additional support for the negative effect of risk perception comes from the risk-as-feelings perspective that posits that emotions often produce behavioural responses that depart from what individuals cognitively view as the best course of action. Hence, strong feelings about a risk source may cause priority of safety even though the cognitive evaluation of the same risk is low. Since cognitive risk assessment had a low effect on risk mitigation demands, the relationship between consequence evaluation and mitigation demands was investigated. This was also in accordance with the findings of Sjöberg (1999), who found a strong relationship here. To account for a possible direct link between consequences and mitigation demands, two additional SEM-analyses were conducted. The model with a direct path from consequences to risk mitigation demands was included, and showed a significant effect of consequences on risk mitigation. Hence, consequences cannot be overlooked when it comes to risk mitigation, and further studies will benefit from taking this relationship into account. However, the effect of consequences on cognitive risk assessment was found to be necessary to give a satisfactory model fit, and this effect cannot be ignored either.

Differences due to risk exposure, gender, age and education

In Table 3, gender, age, education and exposure to risk was included in a second analysis. The difference between the genders was found to be largest when it came to priority ($\beta = -.20$), and had least effect on demand for mitigation given the present model. According to Loewenstein et al. (2001), little of the research on gender differences has paid explicit attention to the role of risk-related emotions. Several studies have shown that female individuals report more vivid imagery than male individuals (see Harshman & Paivio, 1987, for a more extensive review) and that, on average, females experience emotions more intensely than male individuals. In

accordance with the risk-as-feelings perspective and the above-mentioned findings about the vividness of images, this may be one possible explanation of gender differences in both risk perception and demand for mitigation.

In addition to gender, age has been found to be a relevant factor when it comes to differences in risk perception, and several explanations have been offered. The feeling of invulnerability is one proposed explanation for the effect of age on risk perception (e.g. Chesham, Rutter, & Quine, 1993; Dejoy, 1989; Sicard, Jouve, Couderc, & Blin, 2001). The invulnerability hypothesis implies that adolescents either do not consider some potentially harmful consequences of risky behaviour or underestimate the likelihood of these consequences happening to them. In addition, exposure to risk and experience with injury may help to explain age differences. Since young people have been found to be more accident-prone, it is likely that young people more often experience injuries and that this alters their perception of risk, as well as their demand to reduce the risk when they grow older and have more experience.

Some limitations of the study need to be commented upon: One of the reasons why consequences were not found to be as important as probability in accounting for general risk is that the variable included only the perceived consequences per se and might not have covered the anticipated emotions tied to the assessment. This may, in turn, cause feelings associated with consequences to be overlooked. This possibility should be investigated in a later model. Additionally, the questionnaire did not specify 'you as a driver' and this is a potential source of error. However, earlier studies have reported that people will feel as if they have control even if they are passengers (Hammond & Horswill, 2001).

In the prediction of demand for risk mitigation, the priorities people express was found to be the single most important factor. One question following this is: is priority anything but a reflection of a person's attitude? If this is the case, it gives additional support to the negative relationship between cognitive assessment of risk and priority because studies have found strong negative relationships between attitudes and risky driving behaviour (Ulleberg & Rundmo, 2003). In the wake of this consideration, it is also worth mentioning that if priorities are in fact an attitude and demand for risk mitigation is an attitude, are they different aspects of the same phenomenon? Further studies should include attitudes, and the relationship between priorities and attitudes needs further examination.

Within the risk-as-feelings perspective, different feelings are involved, and it may be hard to separate the different forms of feelings. Both anticipatory and anticipated feelings were included in their model. Loewenstein et al. (2001) defined anticipatory emotions as immediate visceral reactions to risks and uncertainties whereas anticipated emotions are not experienced in the immediate present, but are expected to be experienced in the future. Due to the fact that the present investigation involved a questionnaire survey, the role of anticipatory emotions was excluded whereas assessment of anticipated emotion was emphasized.

Some potential problems are related to subjective risk assessments because they are error-prone. One of them is that people substantiate their evaluation based on different interpretations of the question. Social desirability responding – that is the respondent's willingness to manipulate his or her answers according to what he or she regards as socially appropriate – is a well-known methodological problem related to the use of self-report data. In the present study, this was regarded as a minor problem because the questionnaire did not involve questions related to self-assessments and self-reported driving behaviour. Furthermore, questions that could reveal anything that people might not want to convey to the researcher were avoided as far as possible. Another limitation of the present work is that it contains a cross-sectional correlational study. One problem with this design is that it reveals correlations, but it only permits theoretical conclusions about causal relationships. A longitudinal or experimental design would permit a more secure causal conclusion. Further studies should take these considerations into account.

Conclusions

The goal of the study was to investigate whether the framework of the risk-as-feelings perspective could be applied in order to explain demand for risk mitigation. The results revealed that a model based on the hypothesis explained a considerable amount of the variance in mitigation demands. The results also revealed that probability assessment was more important in general risk assessment whereas consequences had a slightly larger effect than probability on feelings. Priority of safety was found to be the most important factor in explaining demand for risk mitigation. Overall, the hypothesis was found to contribute to the understanding of

mitigation demands. Further studies should investigate feelings associated with consequences as well as risk-taking behaviour.

The actual risk behaviour should also be taken into account in further studies. Demand for risk mitigation may also benefit from an investigation about the demand for mitigation that is displayed through the political behaviour which takes place in a given country. The actual action people make in regard to demand for risk mitigation may be different than what was measured here. Since the present results may be seen as preliminary testing of the risk-as-feelings framework further studies should be conducted.

References

- Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior*. Englewood Cliffs, NJ: Prentice-Hall.
- Baron, J., Hershey, J. C., & Kunreuther, H. (2000). *Determinants of priority for risk reduction: The role of worry*. Retrieved May 5, 2005, from <http://www.sas.upenn.edu/~baron/prot.htm>
- Berry, W. D. (1993). *Understanding regression assumptions (quantitative applications in the social sciences)*. Newbury Park, CA: Sage publications.
- Boholm, Å. (1998). Comparative studies of risk perception: A review of twenty years of research. *Journal of Risk Research*, 1, 135-163.
- Browne, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In J. S. Long & K. A. Bollen (Eds.), *Testing structural equation models* (pp. 137-162). Newbury Park, CA: Sage.
- Brun, W. (1992). Cognitive components in risk perception: Natural vs. manmade risks. *Journal of Behavioral Decision Making*, 5, 117-132.
- Byrnes, J. P., Miller, D. C., & Schafer, W. D. (1999). Gender differences in risk taking: A meta-analysis. *Psychological Bulletin*, 125, 364-383.
- Chesham, D. J., Rutter, D. R., & Quine, L. (1993). Motorcycling safety research: A review of the social and behavioural literature. *Social Science and Medicine*, 37, 419-429.
- Cronbach, L. J. (1951). Coefficient alpha and the internal consistency of tests. *Psychometrika*, 16, 297-334.

- Damasio, A. R. (1994). *Descartes error: Emotion, reason, and the human brain*. New York: Avon.
- DeJoy, D. M. (1989). The optimism bias and traffic accident risk perception. *Accident Analysis & Prevention, 21*, 333-340.
- DeJoy, D. M. (1992). An examination of gender differences in traffic accident risk perception. *Accident Analysis & Prevention, 24*, 237-246.
- Drottz-Sjöberg, B. M., & Sjöberg, L. (1990). Risk perception and worries after the Chernobyl accident. *Journal of Environmental Psychology, 10*, 135-149.
- Drottz-Sjöberg, B. M., & Sjöberg, L. (1991). Train and transports: Perceived and real risks. *Rhizikon Risk Research Reports, 2*, 1-27.
- Finucane, M. L., Alhakami, A., Slovic, P., & Johnson, S. M. (2000). The affect heuristic in judgments of risks and benefits. *Journal of Behavioral Decision Making, 13*, 1-17.
- Fischhoff, B., Slovic, P., Lichtenstein, S., Read, S., & Combs, B. (1978). How safe is safe enough? A psychometric study of attitudes towards technological risks and benefits. *Policy Sciences, 9*, 127-152.
- Flynn, J., Slovic, P., & Kunreuther, H. (2001). *Risk, media, and stigma. Understanding public challenges to modern science and technology*. London: Earthscan.
- Flynn, J., Slovic, P., & Mertz, C. K. (1994). Gender, race and environmental health risks. *Risk Analysis, 14*, 1101-1108.
- Glendon, A. I., Dorn, L., Davis, D. R., Matthews, G., & Taylor, R. G. (1996). Age and gender differences in perceived accident likelihood and driver competencies. *Risk Analysis, 16*, 755-762.
- Greenberg, M. R., & Schneider, D. F. (1995). Gender differences in risk perception: Effects differ in stressed vs. non-stressed environments. *Risk Analysis, 15*, 503-511.
- Gregory, R. S., & Satterfield, T. A. (2002). Beyond Perception: The Experience of Risk and Stigma in Community Contexts. *Risk Analysis, 22*, 347-358.
- Gustafson, J., & Stahl, P. A. (2000). *STREAMS user's guide. Version 2.5 for Windows*. Mölndal: Multivariate Ware.
- Gustafson, P. (1998). Gender differences in risk perception: Theoretical and methodological perspectives. *Risk Analysis, 18*, 805-812.

- Hammond, T. B., & Horswill, M. S. (2001). The influence of desire for control on drivers' risk-taking behavior. *Transportation Research Part F: Traffic Psychology and Behaviour*, 4, 271-277.
- Harshman, R. A., & Paivio, A. (1987). Paradoxical sex differences in self-reporting imagery. *Canadian Journal of Psychology*, 41, 303-316.
- Hsee, C. K., & Weber, E. U. (1997). A fundamental prediction error: self-others discrepancies in risk preference. *Journal of Experimental Psychology: General*, 126, 45-53.
- Kobbeltvedt, T., Brun, W., Johansen, B. H., & Eid, J. (2005). Risk as feelings or risk and feelings? A crosslagged panel analysis. *Journal of Risk Research*, 8, 417-437.
- Lajunen, T., & Summala, H. (1995). Driving experience, personality, and safety-motive dimensions in drivers' self-assessments. *Personality and Individual Differences*, 19, 307-318.
- Langer, E. (1975). The illusion of control. *Journal of Personality and Social Psychology*, 32, 311-328.
- Loewenstein, G. F., Weber, E. U., Hsee, C. K., & Welch, N. (2001). Risk as feelings. *Psychological Bulletin*, 127, 267-286.
- Lucey, B. M., & Dowling, M. (2005). The Role of Feelings in Investor Decision-Making. *Journal of Economic Surveys*, 19, 211-237.
- McKenna, F. P. (1993). It won't happen to me: Unrealistic optimism or illusion of control? *British Journal of Psychology*, 84, 39-50.
- Miller, G. A., Levin, D., Kozak, M., Cook, E., McLean, A., & Lang, P. (1987). Individual differences in imagery and the psychophysiology of emotion. *Cognition and Emotion*, 1, 367-390.
- Myers, J. R., Henderson-King, D. H., & Henderson-King, E. I. (1997). Facing technological risks: The importance of individual differences. *Journal of Research in Personality*, 31, 1-20.
- Nunnally, J. C. (1978). *Psychometric theory* (2 ed.). New York: McGraw-Hill.
- Rundmo, T. (2002). Associations between affect and risk perception. *Journal of Risk Research*, 5, 119-135.
- Sicard, B., Jouve, E., Couderc, H., & Blin, O. (2001). Age and risk-taking in French Naval crew. *Aviation Space and Environmental Medicine*, 72, 59-61.
- Sjöberg, L. (1998). Worry and risk perception. *Risk Analysis*, 18, 85-93.

- Sjöberg, L. (1999). Consequences of perceived risk: Demand for mitigation. *Journal of Risk Research*, 2, 129-149.
- Slovic, P. (1999). Comment: Are trivial risks the greatest risks of all? *Journal of Risk Research*, 2, 281-288.
- TemaNord. (2003). *Safety in Building and Construction Industries: State of the art and perspectives on prevention*. Retrieved March 5, 2006, from <http://www.norden.org/pub/velfaerd/arbetsmiljo/sk/TN2004520.pdf>
- Ulleberg, P., & Rundmo, T. (2003). Personality, attitudes and risk perception as predictors of risky driving behaviour among young drivers. *Safety Science*, 41, 427-443.
- van der Plight, J., Otten, W., Richard, R., & van der Velde, F. (1992). Perceived risk of AIDS: Unrealistic optimism and self protective action. In J. B. Pryor & G. Reeder (Eds.), *The social psychology of HIV infection*. Hillsdale, NJ: Erlbaum.
- Vlek, C. J. H., & Stallen, P. J. M. (1981). Judging risks and benefits in the small and in the large. *Organizational Behavior and Human Performance*, 28, 235-271.
- Weinstein, N. D. (1980). Unrealistic optimism about future life events. *Journal of Personality and Social Psychology*, 39, 806-820.
- Weinstein, N. D. (1982). Unrealistic optimism about susceptibility to health problems. *Journal of Behavioral Medicine*, 5, 441-460.
- Zajonc, R. B. (1980). Feeling and thinking: Preferences and no inference. *American Psychologist*, 35, 151-175.

APPENDIX

1. How likely do you think it is that you will experience an injury when using the following means of transportation? (1 = very likely, 7 = very unlikely).
 - a. Car
 - b. Motorcycle
 - c. Scooter
 - d. Bicycle
 - e. As a pedestrian
2. If you experience an accident, how extensive do you think the consequences will be? (1 = certain to be fatal; 7 = certain not to be fatal).
3. How high do you assess the risk of using these means of transportation to be? (1 = extremely high; 7 = extremely high).
4. How worried are you when you think about the risk or probability that you will experience an accident involving personal injury when using these means of transportation? (1 = very worried; 7 = very little).
5. To what extent do you tolerate the risk? (1 = the risk can definitely be tolerated; 7 = the risk should be eliminated completely).
6. When you use the following means of transportation, do you think about what might happen if an accident occurs? (1 = Yes, all the time; 7 = No, never).
7. When you choose the following means of transportation, how high do you prioritize safety? (1 = very high; 7 = very low).
8. Do you think there is something negative associated with using the following means of transportation? (1 = very negative; 7 = not at all negative).
9. How important do you think it is that the risk of using these means of transportation is reduced? (1 = very important; 7 = not important at all).

SPØRRESKJEMA OM RISIKO OG SIKKERHET I TRANSPORTSEKTOREN

INNLEDNING

Hvert år blir over 10 000 mennesker skadet i transportulykker i Norge, og ca. 300 blir drept. Denne situasjonen medfører lidelse og unødvendige tap for enkeltmennesker og for det norske samfunnet. Det er viktig å finne frem til nye virkemidler som kan bedre sikkerheten i transportsektoren, og dermed forebygge ulykker. Ved å besvare dette spørreskjemaet gir du verdifull informasjon om dette.

HVEM STÅR BAK?

Undersøkelsen er en del av Norges forskningsråds program om risiko og sikkerhet i transportsektoren (RISIT), og gjennomføres ved Norges teknisk-naturvitenskapelige universitet NTNU i Trondheim med professor Torbjørn Rundmo som ansvarlig.

DU KAN VINNE EN REISE

De som besvarer spørreskjemaet er med i trekningen av en reise for to personer til en verdi av kr 10 000,-. Trekningen finner sted så snart datainnsamlingen er avsluttet.

KONFIDENSIALITET

All informasjon behandles konfidensielt. Når dataene analyseres, vil ingen kunne se hvem som har avgitt hvilke svar. Skjemaene er nummererte for at vi skal kunne trekke en vinner av reisen. Hvis du ønsker, kan du fjerne nummeret på skjemaet og fortsatt være med på trekningen. Send oss da en henvendelse på at du har besvart skjemaet. Det er selvsagt frivillig å delta i undersøkelsen.

UTFYLLING AV SKJEMAET

Det er ingen rette eller gale svar – vi er ute etter din oppriktige mening og oppfatning. Det er viktig at du besvarer alle spørsmålene, men hvis det er noe du ikke vil eller kan svare på gå videre til neste spørsmål. Returner skjemaet i vedlagt og frankert konvolutt.

HAR DU SPØRSMÅL?

Dersom du har spørsmål om undersøkelsen kan du kontakte stipendiat Bjørg-Elin Moen, e-post: bjorg.moen@svt.ntnu.no, tlf. 73 59 16 55 eller professor Torbjørn Rundmo på tlf 73 59 16 56

Det tar ca. 20 minutter å fylle ut skjemaet.

Vær oppmerksom på at det er spørsmål på begge sider av arkene!

På forhånd takk for hjelpen!

NTNU



LES
DETTE
FØR DU
STARTER!

Skjemaet skal leses av en maskin. Følg derfor disse reglene:

- Bruk svart/blå kulepenn, ikke tusj/svak blyant. Skriv tydelig og ikke utenfor feltene. Bare feltene blir lest.
- Sett bare ett kryss på hvert spørsmål, slik:
- Krysser du feil, setter du nytt kryss på rett sted. Pass på at det rette krysset blir **kraftigst**, slik:
- Ikke bruk overstryking når du skal korrigere feilkryssinger.
- Ikke brett arkene, og ikke kopier skjemaet. Bare originale skjema blir lest.

Feil kryss

Korrigering

VURDERING AV TRANSPORTRISIKO

1 a. Hvor sannsynlig mener du det er at en person bosatt i Norge skal bli utsatt for en personskade ved bruk av følgende transportmidler?

	Svært sannsynlig		Verken /eller			Svært usannsynlig	
	1	2	3	4	5	6	7
1. Rutefly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Tog	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Buss	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Ferge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Hurtigbåt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Drosje	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Egen bil	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Motorsykkel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Moped/scooter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Sykkel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Som fotgjenger	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

1 b. Hvor sannsynlig mener du det er at en person bosatt i Norge skal bli utsatt for en personskade som følge av minst ett av de ovenfor nevnte transportmidlene?

	Svært sannsynlig		Verken /eller			Svært usannsynlig	
	1	2	3	4	5	6	7
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

1 c. Hvor sannsynlig mener du det er at du selv skal bli utsatt for en personskade som følge av minst ett av de ovenfor nevnte transportmidlene?

	Svært sannsynlig		Verken /eller			Svært usannsynlig	
	1	2	3	4	5	6	7
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. Hvis det først skjer en ulykke, hvor sikkert mener du det er at noen omkommer (dødsulykke)?

	Helt sikkert dødsulykke		Både /og			Helt sikkert ikke dødsulykke	
	1	2	3	4	5	6	7
1. Rutefly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Tog	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Buss	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Ferge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Hurtigbåt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Drosje	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Egen bil	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Motorsykkel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Moped/scooter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Sykkel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Som fotgjenger	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

DIN BEKYMRING

3. Ovenfor vurderte du sannsynligheten for skade som følge av bruk av transportmidler. Ofte vurderer vi sannsynligheter forskjellig fra hvor bekymret vi er når vi tenker på dette. Hvor bekymret er du når du tenker på risikoen eller sannsynligheten for ulykker med personskaade ved bruk av de ulike transportmidlene?

	Svært bekymret		Verken /eller			Svært lite bekymret	
	1	2	3	4	5	6	7
1. Rutefly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Tog	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Buss.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Ferge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Hurtigbåt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Drosje	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Egen bil.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Motorsykkel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Moped/scooter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Sykkel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Som fotgjenger	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Svært bekymret		Verken /eller			Svært lite bekymret	
	1	2	3	4	5	6	7
12. Når du tenker på de ovenfor nevnte risikokildene, hvor bekymret er du generelt sett?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

BEHOV FOR RISIKOREDUSERENDE TILTAK

4. Hvor viktig syns du det er at norske myndigheter iverksetter risikoreduserende tiltak når det gjelder følgende:

	Svært viktig		Verken /eller			Svært lite viktig	
	1	2	3	4	5	6	7
1. Rutefly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Tog	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Buss.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Ferge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Hurtigbåt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Drosje	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Egen bil.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Motorsykkel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Moped/scooter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Sykkel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Som fotgjenger	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Svært viktig		Verken /eller			Svært lite viktig	
	1	2	3	4	5	6	7
12. Hvor viktig syns du det er at norske myndigheter iverksetter tiltak mot transportrisiko i sin alminnelighet?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Ingen tillit		Verken /eller			Svært stor tillit	
	1	2	3	4	5	6	7
13. Hvor stor tillit har du til myndighetenes evne til å redusere disse problemene?.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

TRANSPORT OG SIKKERHET

5. Hvor enig eller uenig er du i følgende påstander?
- | | Helt enig
1 | 2 | 3 | Verken /eller
4 | 5 | 6 | Helt uenig
7 |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 1. Tiltak som kan bedre sikkerheten i transportsektoren blir ofte stoppet hvis de er for kostnadskrevenende | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Ansvarlige myndigheter viser tilstrekkelig ansvar for sikkerheten i transportsektoren | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Jeg har mange ideer om tiltak som kunne forhindre ulykker i transportsektoren..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Jeg liker å diskutere ulykkesforebyggende tiltak med andre | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Massemediene henter inn nødvendig informasjon når de fokuserer på tiltak innen transportsektoren..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Massemediene tenker kortsiktig når de skriver om ulykker og katastrofer innen transportsektoren..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. Politikerne henter inn den informasjon som skal til for å iverksette tiltak innen transportsektoren | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. Når politikerne fatter beslutninger i samferdselssektoren blir sikkerhet alltid prioritert | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 9. Politikerne bruker all nødvendig informasjon for å fatte riktige beslutninger | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

BRUK AV TRANSPORTMIDLER

6. Hvor ofte bruker du følgende transportmidler?
- | | Svært ofte
1 | Ofte
2 | Av og til
3 | Sjelden
4 | Aldri
5 |
|------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 1. Rutefly | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Tog | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Buss..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Ferge | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Hurtigbåt..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Drosje | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. Egen bil..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. Motorsykkel | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 9. Moped/scooter | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 10. Sykkel..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

PRIORITERINGER

7. Hva er viktig når du skal velge hvilke transportmidler du skal bruke?
- | | Svært viktig
1 | 2 | 3 | Verken /eller
4 | 5 | 6 | Svært lite viktig
7 |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 1. Tilgjengelighet..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Fremkommelighet | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Tidsbruk..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Sikkerhet i forhold til ulykker | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Sikkerhet i forhold til kriminalitet | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Komfort | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. Økonomi | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

DINE MENINGER OM TRANSPORTSIKKERHET

8. Ta stilling til følgende påstander:
- | | Svært enig
1 | 2 | 3 | Verken /eller
4 | 5 | 6 | Svært uenig
7 |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 1. Jeg stoler på ekspertene når de forteller meg hvilke transportmidler som er tryggest..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Det er i orden at de som etterforsker transportulykker holder tilbake informasjon om ulykken..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. For å kunne drive næringsvirksomhet må transportselskapene noen ganger prioritere økonomi foran sikkerhet..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Ny teknologi vil løse problemene i transportsektoren..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Transportulykker kan bare unngås hvis menneskers atferd endres radikalt..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Lover og forskrifter om sikkerhet er bare ansvarsfraskrivelse fra myndighetenes side..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. Det er ikke lurt å påpeke andres brudd på sikkerhetsregler og vedtekter..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. Skal man følge alle sikkerhetsregler og forskrifter, vil samfunnet stoppe opp..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

DINE MENINGER OM ANDRE FORHOLD

9. Ta stilling til følgende påstander:
- | | Svært enig
1 | 2 | 3 | Verken /eller
4 | 5 | 6 | Svært uenig
7 |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 1. Det er for lite disiplin blant ungdom i dag..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Det er bare rett og rimelig at jo høyere status du har, jo mer kan du ta deg til rette..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Jeg er mer nøye med hva som er rett og galt enn de aller fleste andre..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Forskrifter og lover for å forhindre ulykker blir ofte oversett og brutt..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. I et rettferdig samfunn bør folk tjene bedre jo høyere kvalifikasjoner de har..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Et fritt og demokratisk samfunn gir næringslivet frie muligheter for ekspansjon..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. Folk som arbeider hardt belønnes for lite..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. De mest intelligente bør få de mest ansvarsfulle posisjonene i samfunnet..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 9. Å nå toppen skyldes egeninnsats..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 10. Individuelle behov for å komme seg frem i et viktig ærend kan i mange tilfeller være overordnet transportsikkerhet..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 11. Hvis alle i Norge ble behandlet likt ville vi hatt færre problemer..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 12. De som tjener godt bør få høyere bøter når de bryter lover og forskrifter enn andre..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 13. Det er ingen vits i å ta hensyn til andre – det slår bare tilbake på en selv..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 14. Å ta hensyn til andre lønner seg sjelden..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 15. Jeg blir ofte behandlet urettferdig..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 16. Det er lite å tjene på å stole på andre..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 17. Ulykker vil alltid skje fordi mennesker er upålitelige..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 18. Forsvaret i Norge bør styrkes..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

	Svært enig		Verken /eller			Svært uenig	
	1	2	3	4	5	6	7
19. Politiet bør ha anledning til å avlytte private telefonsamtaler	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. Problemet med folk i dag er at de utfordrer autoriteter for ofte	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21. Det er viktig å bevare våre tradisjoner og kulturarv	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22. Det er viktig å videreføre familietradisjoner.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23. Jeg synes det er viktig å være presis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24. Fortsatt økt velstand er nøkkelen til økt livskvalitet.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25. Dette landet ville klart seg bedre dersom vi sluttet å tenke at alt skal være likt for alle	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26. Styresmaktene bør sørge for at alle har bra levestandard.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27. Jeg vil støtte en skatteendring som fører til at de med høye lønninger får høyere skatt.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28. Landet vårt trenger en "rettferdighetsrevolusjon" slik at vi får mer rettferdig fordelig av godene.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29. Jeg tenker ikke noe særlig på politikk fordi jeg ikke har noen innflytelse likevel.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30. Jeg føler at livet er som et lotteri.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31. Selv om du arbeider hardt, vet du ikke om det vil gi noen gevinst.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

VURDERING AV ANNEN RISIKO

10. Hvor sannsynlig mener du det er at en person bosatt i Norge blir utsatt for følgende?

	Svært sannsynlig		Verken /eller			Svært usannsynlig	
	1	2	3	4	5	6	7
1. Krig	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Terrorisme	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Kjernefysiske våpen.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Flykapring	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Storm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Ras	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Snøskred	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Flom.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Brann	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Blind vold	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Håndvåpen	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

11. Hvor sannsynlig mener du det er at en person bosatt i Norge får en helseskade som følge av...

	Svært sannsynlig		Verken /eller			Svært usannsynlig	
	1	2	3	4	5	6	7
1. Industriforurensning.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Radioaktiv stråling fra kjernekraftverk.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Hullet i ozonlaget.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Global oppvarming/drivhuseffekt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Stråling fra høyspentledninger	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Konserveringsmidler i mat	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- | | Svært sannsynlig | | Verken /eller | | | Svært usannsynlig | |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 7. Kjemiske tilsetningsstoffer i mat | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. Smittefarlig mat..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 9. Rester etter sprøytemidler i mat | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 10. Genmodifisert mat | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 11. Alkohol..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 12. Røyking | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 13. For lite mosjon | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | | | | | | | |
| 14. Usunne matvaner | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 15. Solbading..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 16. Stråling fra mobiltelefon | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 17. Stråling fra mobiltelefonsendere | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 18. Radon (i berggrunnen)..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 19. Taksten i hodet | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 20. Bli forkjølet..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 21. Snuble på gata | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 22. Seksuell trakassering..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 23. Seksuelle overgrep | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

- | | Svært sannsynlig | | Verken /eller | | | Svært usannsynlig | |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 18. Hvor sannsynlig mener du det er at <u>du selv</u> skal bli utsatt for en personskade som følge av minst en av risikokildene ovenfor? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

- | | Svært bekymret | | Verken /eller | | | Svært lite bekymret | |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 19. Hvor <u>bekymret</u> er du for risikoen for at du skal bli utsatt for en personskade som følge av minst en av risikokildene ovenfor? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

- | | Svært stor tillit | | Verken /eller | | | Svært liten tillit | |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 20. Hvor stor <u>tillit</u> har du til myndighetenes håndtering av risikokildene ovenfor? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

- | | Svært viktig | | Verken /eller | | | Svært lite viktig | |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 21. Hvor <u>viktig</u> synes du generelt det er at norske myndigheter iverksetter tiltak mot slike problemer i sin alminnelighet? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

- | | Svært sannsynlig | | Verken /eller | | | Svært usannsynlig | |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 22. Hvor sannsynlig mener du det er at <u>du selv</u> skal bli utsatt for en helseskade i jobben din? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 23. Hvor sannsynlig mener du det er at <u>en person bosatt i Norge</u> får en helseskade i jobben sin? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

- | | Svært bekymret | | Verken /eller | | | Svært lite bekymret | |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 24. Hvor bekymret er du når du tenker på risikoen for at du skal få en helseskade i jobben din? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

OM DEG SELV

12. Hvor enig eller uenig er du i utsagnene nedenfor?

	Svært enig 1	2	Verken /eller 3	4	Svært uenig 5
1. Jeg er ikke en person som pleier å bekymre seg	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Jeg blir lett skremt.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Jeg føler meg sjelden redd eller engstelig	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Jeg føler meg ofte anspent og nervøs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Jeg bekymrer meg sjelden for fremtiden	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Jeg er ofte bekymret for ting som kan gå galt.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Jeg har færre redsler enn de fleste.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Av og til får jeg skremmende tanker	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Jeg søker ofte spenning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Jeg ville mistrives på ferie i Las Vegas.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Jeg har av og til gjort ting bare for spenningens eller "kickets" skyld.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Jeg unngår gjerne sjokkerende eller skremmende filmer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Jeg liker å være der det skjer noe	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Jeg elsker spenningen på berg- og dalbaner.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Jeg tiltrekkes sterke farger og stiler	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. Jeg liker å være blant tilskuerne på idrettsarrangementer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. Jeg pleier å være skeptisk og kynisk til andre menneskers hensikter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. Jeg tror at folk flest er velmenende.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. Jeg tror at folk flest vil utnytte deg hvis du lar dem gjøre det.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. Jeg tror at de jeg omgås stort sett er ærlige og redelige	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21. Jeg blir mistenksom når noen gjør noe hyggelig mot meg	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22. Min umiddelbare reaksjon er å stole på folk	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23. Jeg tror som regel det beste om folk	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24. Jeg har stor tro på menneskets natur	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25. Jeg får virkelig vist hva jeg er god for i jobben min.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26. Det finnes kanskje en viss risiko i alt vi gjør, men det er en del av fascinasjonen ved det å leve	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27. Jeg kjenner meg veldig sikker på mine evner i viktige situasjoner.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28. Det er naturlig at man konkurrerer med andre og vil være best	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29. Jeg har mange muligheter til å vise hva jeg er god for	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30. Mange jeg treffer er imponert over hvordan jeg takler viktige ting i livet.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31. Jeg vil være den som bestemmer og tar ansvar.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32. Min beslutningskraft imponerer nok omgivelsene en god del	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33. For å nå frem, må man våge noe	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34. Forsiktighet er en annen måte å beskrive feighet på.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35. Fremgang får man bare ved å ta sjanser.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Husk: Bare ett kryss på hvert spørsmål!

Plass for kommentarer. Kommenterer du bestemte spørsmål, oppgir du spørsmålsnummer.

SPØRRESKJEMA OM RISIKO OG SIKKERHET I TRANSPORTSEKTOREN

INNLEDNING

Tidligere i år besvarte du et spørreskjema om risiko og sikkerhet i transportsektoren. Prosjektet pågår fremdeles og tar sikte på og avsluttes i 2007. Målet med prosjektet er å finne frem til nye virkemidler som kan bedre sikkerheten i transportsektoren, og dermed forebygge ulykker.

I forbindelse med den første runden svarte 1720 personer på skjemaet og vi er meget godt fornøyd med kvaliteten på besvarelsene.

Du svarte positivt til å delta i en oppfølgingsundersøkelse og derfor henvender vi oss til deg på nytt. Det vil ta 10-15 minutter å fylle ut skjemaet.

KONFIDENSIALITET

All informasjon behandles konfidensielt. Når dataene analyseres, vil ingen kunne se hvem som har avgitt hvilke svar. Det er selvsagt frivillig å delta i undersøkelsen, men vi håper at du kan ta deg tid til å besvare også dette spørreskjemaet.

HVEM STÅR BAK?

Undersøkelsen er en del av Norges forskningsråds program om risiko og sikkerhet i transportsektoren (RISIT), og gjennomføres ved Norges teknisk-naturvitenskapelige universitet NTNU i Trondheim med professor Torbjørn Rundmo som ansvarlig.

UTFYLLING AV SKJEMAET

Det er ingen rette eller gale svar – vi er ute etter din oppriktige mening og oppfatning. Det er viktig at du besvarer alle spørsmålene. Returner skjemaet i vedlagt og frankert konvolutt.

HAR DU SPØRSMÅL?

Dersom du har spørsmål om undersøkelsen kan du kontakte stipendiat Bjørg-Elin Moen, e-post: bjorg.moen@svt.ntnu.no, tlf. 73 59 16 55 eller professor Torbjørn Rundmo på tlf 73 59 16 56

LES DETTE FØR DU STARTER!	<p>Skjemaet skal leses av en maskin. Følg derfor disse reglene:</p> <ul style="list-style-type: none">• <i>Bruk svart eller blå kulepenn, ikke tusj eller svak blyant.</i>• <i>Skriv så tydelig du kan. Ikke skriv utenfor feltene.</i>• <i>Kryss av slik: <input type="checkbox"/> Krysser du feil, fyller du <u>hele</u> feltet med farge, slik: <input type="checkbox"/> Sett så kryss i rett felt.</i>• <i>Ikke kopier dette skjemaet – bruk bare originalen. Kopier blir ikke lest.</i>• <i>Sett bare ett kryss på hvert spørsmål.</i>
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NTNU



VURDERING AV TRANSPORTRISIKO

1. I det forrige spørreskjemaet spurte vi deg hvordan du vurderte risikoen generelt for en person bosatt i Norge. Under ber vi deg vurdere hvor sannsynlig det er at *du selv* skal bli utsatt for en personskada når du bruker følgende transportmidler?

	Svært sannsynlig					Svært usannsynlig	
	1	2	3	4	5	6	7
1. Rutefly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Tog	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Buss.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Ferge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Hurtigbåt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Egen bil.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Motorsykkel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Moped/scooter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Sykkel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Som fotgjenger	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. Hvis du utsettes for en ulykke, hvor omfattende tror du konsekvensene vil være?

	Katastrofale					Bagatellmessige	
	1	2	3	4	5	6	7
1. Rutefly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Tog	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Buss.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Ferge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Hurtigbåt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Egen bil.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Motorsykkel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Moped/scooter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Sykkel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Som fotgjenger	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. Hvor stor vurderer du risikoen ved bruk av disse transportmidlene til å være?

	Ekstremt stor					Ikke eksisterende	
	1	2	3	4	5	6	7
1. Rutefly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Tog	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Buss.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Ferge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Hurtigbåt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Egen bil.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Motorsykkel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Moped/scooter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Sykkel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Som fotgjenger	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

11. Når du vurderer alle de overnevnte transportmidlene, hvor stor anser du risikoen generelt sett for å være?

4. Hvor *bekymret* er du når du tenker på risikoen eller sannsynligheten for at *du* skal utsettes for en ulykke med personskade når du bruker de ulike transportmidlene?

	Svært bekymret					Svært lite bekymret	
	1	2	3	4	5	6	7
1. Rutefly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Tog	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Buss.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Ferge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Hurtigbåt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Egen bil.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Motorsykkel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Moped/scooter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Sykkel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Som fotgjenger	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Når du tenker på de ovenfor nevnte risikokildene, hvor bekymret er du for å bli utsatt for en ulykke generelt sett?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5. Hvordan vurderer du muligheten for å beskytte deg selv mot denne risikoen?

	Ekstremt stor					Ikke eksisterende	
	1	2	3	4	5	6	7
1. Rutefly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Tog	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Buss.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Ferge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Hurtigbåt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Egen bil.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Motorsykkel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Moped/scooter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Sykkel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Som fotgjenger	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Når du vurderer de ovenfor nevnte transportmidlene hvor stor mulighet har du generelt sett til å beskytte deg mot risikoen?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6. I hvilken grad tolererer du risikoen?

	Risikoen kan absolutt bli tolerert					Risikoen bør elimineres fullstendig	
	1	2	3	4	5	6	7
1. Rutefly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Tog	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Buss.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Ferge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Hurtigbåt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Egen bil.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Motorsykkel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Moped/scooter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Sykkel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Som fotgjenger	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Generelt sett, i hvor stor grad tolererer du risikoen forbundet med bruk av de ovenfor nevnte transportmidlene?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

7. Når du bruker følgende transportmidler, tenker du på hva som kan skje hvis det skjer en ulykke?

	Ja, hele tiden							Nei, aldri
	1	2	3	4	5	6	7	
1. Rutefly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2. Tog	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3. Buss.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4. Ferge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5. Hurtigbåt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
6. Egen bil.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
7. Motorsykkel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
8. Moped/scooter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
9. Sykkel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
10. Som fotgjenger	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
11. Når du bruker ovenfor nevnte transportmidler, tenker du på hva som kan skje hvis det skjer en ulykke?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

8. Når du velger følgende transportmidler, hvor høyt prioriterer du sikkerhet?

	Svært høyt				Svært lavt		
	1	2	3	4	5	6	7
1. Rutefly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Tog	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Buss.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Ferge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Hurtigbåt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Egen bil.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Motorsykkel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Moped/scooter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Sykkel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Som fotgjenger	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Generelt, i hvor stor grad prioriterer du sikkerhet når du velger en eller flere av de ovenfor nevnte transportmidlene?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

9. Synes du det er noe negativt forbundet med bruk av disse transportmidlene?

	Svært negativt					Overhodet ikke negativt	
	1	2	3	4	5	6	7
1. Rutefly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Tog	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Buss.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Ferge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Hurtigbåt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Egen bil.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Motorsykkel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Moped/scooter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Sykkel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Som fotgjenger	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Generelt, i hvor stor grad er det noe negativt forbundet med bruk av de ovenfor nevnte transportmidlene?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

RISIKOREDUSERENDE TILTAK

10. Hvor viktig er det for deg at risikoen ved bruk av disse transportmidlene reduseres?

	Svært viktig				Svært lite viktig		
	1	2	3	4	5	6	7
1. Rutefly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Tog	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Buss	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Ferge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Hurtigbåt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Egen bil	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Motorsykkel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Moped/scooter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Sykkel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Som fotgjenger	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Generelt, hvor viktig er det for deg at risikoen ved bruk av de ovenfor nevnte transportmidlene reduseres?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

DINE VURDERINGER

11. Ta stilling til følgende påstander:

	Svært enig				Svært uenig		
	1	2	3	4	5	6	7
1. Mange sikkerhetsregler kan ikke overholdes hvis det skal være flyt i trafikken	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Noen ganger er det nødvendig å tøyne reglene for å ha flyt i trafikken	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Man bør overholde reglene uansett hvordan forholdene er	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Personer som tar sjanser og bryter trafikkreglene er ikke nødvendigvis mindre sikre enn de som gjør alt helt lovlig	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Det er greit å kjøre for fort når det ikke er andre i nærheten	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Det er greit å ta sjanser når det kun er du selv som utsettes for risiko	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Sikkerhetsregler og lover er ofte for kompliserte til at de kan følges i praksis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Det skulle vært strengere straffer for å bryte sikkerhetsforskriftene	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Det er ikke rart at folk bryter lover og regler i Norge ettersom mange av dem er unødvendige	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Det er helt greit å bryte sikkerhetsreglene under transport av mennesker	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Det er helt greit å bryte sikkerhetsreglene under transport av gods	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Det er viktigere å bidra til fremkommelighet enn å alltid kjøre lovlig	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Jeg er villig til å betale mer skatt for å få sikrere veier	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Jeg synes det er greit med bompenger hvis disse pengene er øremerket veiutbygging	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Det er greit med dyrere togbilletter hvis dette fører til tryggere reiser	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. Sikkerheten i transportsektoren bør økes selv om dette fører til høyere billettpriser	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. Sikkerheten på veiene bør styrkes selv om dette fører til økte utgifter for brukerne	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- | | Svært enig | 2 | 3 | 4 | 5 | 6 | Svært uenig |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| | 1 | | | | | | 7 |
| 18. Det er viktig med kampanjer rettet mot de som er i faresonen selv om dette fører til økte skatter..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 19. Ulykkesberedskapen bør bedres selv om dette betyr økte utgifter..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 20. Når jeg tenker på ulykker blir jeg kvalm/uvel..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 21. Hvis det skjer mange ulykker i transportsektoren blir jeg urolig..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 22. Det er så liten sjanse for å dø ved bruk av transportmidler at vi kan slutte å bekymre oss for det..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 23. Når jeg leser om ulykker som har skjedd med et transportmiddel påvirker dette mitt valg av transportmiddel..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 24. Jeg tenker mye på alt det uforutsette som kan skje når jeg bruker ulike transportmidler..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

PRIORITERING AV SIKKERHET

12. Ta stilling til følgende påstander:
- | | Svært enig | 2 | 3 | 4 | 5 | 6 | Svært uenig |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| | 1 | | | | | | 7 |
| 1. Når jeg skal velge transportmiddel prioriterer jeg sikkerhet over alt annet..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Mine venner og bekjente prioriterer sikkerhet like høyt som meg..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Jeg vil velge et risikabelt fremkomstmiddel hvis det ikke er andre måter å komme seg frem på..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Jeg risikerer ikke liv og helse ved å velge risikable transportmidler..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Det er mitt ansvar også å si fra når jeg ser noe uforsvarlig..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Når jeg ferdes med offentlige transportmidler som buss og jernbane vil jeg gå av ved første anledning hvis sikkerhetsregler blir brutt..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. Jeg sier alltid ifra hvis andre bryter regler og normer for god sikkerhet..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. Jeg følger sikkerhetsreglene når jeg bruker transportmidler..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 9. Det er viktig at det legges kontinuerlig vekt på sikkerhet..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 10. Jeg tar risiko for å komme frem hvis andre gjøre det samme..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 11. Jeg forstår sikkerhetsreglene i transportsektoren..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 12. Å velge et sikkert transportmiddel betyr mye for meg..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 13. Sikkerhet mot skader og ulykker er viktigere enn kjærlighet..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

13. Spørsmålene nedenfor er til deg som har førerkort.

Har du ikke førerkort, hopper du direkte til spørsmålene nederst på siste side.

- | | Svært enig | 2 | 3 | 4 | 5 | 6 | Svært uenig |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| | 1 | | | | | | 7 |
| 1. Når jeg sammenligner meg med andre sjåførere, innser jeg at jeg har mye å lære..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Jeg er en god sjåfør sammenlignet med en på samme alder, med lik erfaring..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Jeg er en god sjåfør sammenlignet med en med samme kjønn, med lik erfaring..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Jeg er en god sjåfør sammenlignet med et annet familiemedlem..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Jeg er en god sjåfør sammenlignet med andre sjåførere generelt..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Jeg er god til å vurdere hva jeg skal gjøre i vanskelige situasjoner..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. Jeg føler meg trygg på min rolle som sjåfør..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

- | | Svært enig | | | | | | | Svært uenig |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
| 8. Mine kjøreferdigheter er ikke gode nok | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 9. Siden jeg er en god sjåfør, er det akseptabelt å kjøre litt for fort | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 10. Jeg mister aldri kontroll over kjøretøyet | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 11. Jeg tror ikke at sjansen for at jeg skal utsettes for en ulykke er større selv om jeg kjører for fort | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 12. Hvis jeg er involvert i en ulykke er sjansen stor for at det ikke er min feil | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 13. Jeg vet nøyaktig hvor fort jeg kan kjøre, og likevel kjøre sikkert | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 14. Jeg angrer aldri på beslutninger jeg tar i trafikken | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 15. Jeg er alltid sikker på hvordan jeg skal oppføre meg i ulike trafikksituasjoner | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 16. Jeg forholder meg alltid rolig og rasjonell i trafikksammenheng | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 17. Jeg vet alltid hva jeg skal gjøre når vanskelige situasjoner oppstår i trafikken | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 18. Som sjåfør føler jeg meg under konstant press når jeg ferdes i trafikken | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 19. Jeg føler meg ofte presset til å ta avgjørelser som ikke er gjennomtenkt | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 20. Det oppstår ofte situasjoner jeg ikke har kontroll over i det hele tatt | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 21. Ofte kjenner jeg ikke trafikreglene godt nok til å vite hva jeg skal gjøre | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 22. Forstyrrelser fører ofte til at jeg mister konsentrasjonen om kjøringen | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 23. Hvis jeg blir involvert i en ulykke, er det fordi jeg ikke har kjørt slik jeg burde | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 24. Hvis jeg blir involvert i en ulykke, er det fordi jeg ikke har vært oppmerksom nok på kjøringen min | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 25. Ulykkesfri kjøring er et resultat av førerens evne til å være oppmerksom på hva som skjer på veiene og fortauene | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 26. Ulykker er kun et resultat av feil begått av føreren | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 27. Føreren kan nesten alltid klandres når en ulykke skjer | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 28. Det er alltid mulig å forutsi hva som skjer på veien, og derfor er det mulig å forebygge nesten hvilken som helst ulykke | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 29. En forsiktig fører kan forhindre en hvilken som helst ulykke | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 30. Føreren kan alltid forutsi hva som kommer til å skje; det er grunnen til at det ikke er rom for overraskelser på veiene | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 31. Forebygging av ulykker avhenger kun av føreren og hans karakteristika, ikke utenforliggende faktorer | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

BAKGRUNNSINFORMASJON

1. Kjønn: Kvinne ₁ Mann ₂

2: Fødselsår:

19 | |

Plass for kommentarer. Kommenterer du bestemte spørsmål, oppgir du spørsmålsnummer.