



## **Previous Experiences and Risk Perception: The Role of Transference**

**Susanna Öhman<sup>1\*</sup>**

<sup>1</sup>*Risk and Crisis Research Center (RCR), Department of Social Sciences, Mid Sweden University, 831 25 Östersund, Sweden.*

### **Author's contribution**

*The sole author designed, analyzed and interpreted and prepared the manuscript.*

### **Article Information**

DOI: 10.9734/JESBS/2017/35101

#### Editor(s):

(1) Nwachukwu Prince Oloolube, Professor, Department of Educational Foundations and Management, Faculty of Education, University of Education, Port Harcourt, Nigeria.

#### Reviewers:

(1) Cristian Rogério Foguesatto, Federal University of Rio Grande do Sul, Brazil.

(2) Camila Barreto Bonfim, University of the State of Bahia, Brazil.

(3) Benyong Wei, Institute of Geology, China.

Complete Peer review History: <http://www.sciedomains.org/review-history/21712>

**Original Research Article**

**Received 27<sup>th</sup> June 2017**  
**Accepted 28<sup>th</sup> October 2017**  
**Published 2<sup>nd</sup> November 2017**

### **ABSTRACT**

**Aims:** The aim of the article is to investigate how experiences of crisis such as accidents, illnesses, violence and natural catastrophes influence perceptions of risk in general. The questions this article poses are whether there are some experiences significant enough to change an individual's perception not only of the kind of risk experienced but also of other kinds of risks and whether there are certain experiences that are particularly powerful.

**Study Design, Place and Duration of Study:** The analyses use data from two Swedish national surveys, 'Society and Values', that took the form of mail polls conducted in the winters of 2005 and 2008. Both polls used questionnaires that focus on risk perception, risk communication, risk behavior, experience, and values. The dataset used each year is composed of two representative samples of the Swedish population.

**Methodology:** The samples consisted of people between the ages of 16 and 75: two national random samples (n=2000 each) and two random samples of people living in areas with a relatively large population of people with foreign backgrounds (n=750 each). The total number of respondents was 1,472 in 2005 and 951 in 2008.

**Results:** The results show that previous experience is a strong predictor of higher risk perception even after controlling for gender, origin, income, education and values. Depending on previous

\*Corresponding author: E-mail: [susanna.ohman@miun.se](mailto:susanna.ohman@miun.se);

experiences of certain hazards and crises, the individual's perception of risks related to these experiences will vary.

**Conclusion:** This article has shown that different categories of experiences are powerful to transfer the feeling of dislike or fear not only to the related risk but also to other kinds of risk. One example is, being the victim of violence increases the level of risk perceived not only for violence but for several lifestyle risks and known risks as well.

*Keywords: Previous experience; risk perception; survey results; transference.*

## 1. INTRODUCTION

Experimental studies have shown that direct contact or experience with an attitude object, for instance a risk, results in stronger attitudes as well as greater attitude-behaviour consistency. However, many potential risks in today's society are not experienced directly by everyone because of low frequency or high consequences. Being exposed to natural catastrophes like earthquakes or severe flooding is unlikely as well as potentially life threatening. In addition, more frequent crises like traffic accidents and home fires are still quite unusual, and few people have personal experiences with these. The question posed here is therefore as follows: Can experience from one or more severe crises be transferred to a more general sensitivity toward risk and thereby relatively higher risk perception?

This article is more than anything an empirical investigation into the relationship between, on one hand, the amount and kind of individual experience with severe illnesses, accidents and disasters and perception of risk on the other. Previous studies have focused on the relationship between the experience and perception of the same risk or risks related to the experience or between mediated experiences and perception as well as behaviour. In this article, the aim is to find out whether some experiences are significant enough to change an individual's perception not only of the kind of risk experienced but of risks in general and whether there are certain experiences that are particularly powerful. Kahneman & Tversky [1] famous study shows that three heuristics are employed in decisionmaking under uncertainty; representativeness, availability of instances or scenarios and adjustment from an anchor. These heuristics are effective but they lead to biases, that is, previous experience influence the perception of risks.

Experience as a way to understand the perception of risk and risk taking behaviour is interesting from a sociological perspective,

considering that the distribution of accidents, illnesses and experiences of other kinds of crisis and disasters is not evenly distributed among people. On the contrary, many risks are gendered and bound to socioeconomic structures in society (Barnshaw & Trainor [2]; Morrow [3]; Rodriguez et al. [4]; Wisner et al. [5]). By putting the focus on the individual's experience, it is possible to identify relationships not only with higher and lower risk judgements but also patterns among people concerning the effect of experiences. The aim of this article is to investigate how individual experiences of crisis, such as traffic accidents, illnesses, violence and natural catastrophes, influence risk perception.

Before presenting the data and results of the current study, a short overview of previous theoretical and empirical studies is given.

### 1.1 Theory and Previous Research

Theoretically, experience as an explanation for risk perception can be related to affect heuristics, the subtle forms of emotions or "gut feelings" we have towards external stimulus based on previous experiences (Slovic [6]; Slovic [7]). Risk perception was originally defined as a form of cognitive and systematic information processes, but, over time, the importance of intuitive and experiential as well as affective processes has been recognized. Affect also impacts risk/benefit judgements – hazards that are associated with positive affects, or which are "liked", and which are judged as more beneficial than hazards that are "disliked". Hence, the latter are judged as having few benefits and high risks (Alhakami & Slovic [8]). The experiences forming the subtle feelings of like/dislike become in this way one determinant for individual risk perception. From a risk assessment perspective, this has been framed as an individual's "prison of experience" (Kates [9]). That is, people, including experts, tend to limit the assessment of risks to previous experiences and knowledge of previous crises and disasters and disregard or are unaware of threats greater than or different from their

individual or collective experience (Kates [9], p. 249).<sup>1</sup> Barnett & Breakwell [10] study examines how far differences in experience of risk activities can explain individual variability in risk assessments. They found that all studied aspects of experience each related to risk assessment but their relationship depended on whether the risk experiences were voluntary or not. This means that experience plays a key role not only in understanding individual risk perception and risk-related behaviour but can also influence risk assessment and governance of risk on a societal level.

From a sociological perspective “experience” can be described as an in between concept (Zinn [11]). In the discussion of whether individual risk judgments are strictly rational or rather based on constructions of risk as well as individual emotional and less “rational” processes, trust, intuition and emotions have been described as in between strategies. Concepts such as these are all more or less related to the individual’s experiences as well as beliefs and social context: “...a [risk] situation or event is like a previously experienced situation and therefore the decisions, action, and feelings from the previous situation are pertinent to the current situation” (Zinn [11], p. 446). Trust, emotion and not least intuition are theoretical concepts found both in sociological and risk perception studies (Giddens [12]; Luhmann [13]; Slovic [14]), but rather than analysing these concepts, this study focuses on the underlying factor: experience. Experience as a predictor of higher risk perception has, as noted, been used in psychological studies of attitudes and affects but is also found in sociological studies of experience. As already mentioned, experience is often referred to as something emotional and intuitional, but experience is also an important element in the micro sociological theory by Mead [15].

Depending on previous experiences of certain hazards and crises, the individual’s perception of risks related to these experiences will vary. The question is, however, whether some categories of experiences are more powerful than others in relation to risk perception and whether some experiences are powerful enough to transfer the feeling of dislike or fear not

only to the related risk but also to other kinds of risk.

Previous research of the relationship between experience and risk perception is concentrated on disasters/hazards (McGee, McFarlane & Varghese [16]; Mishra & Suar [17]; Whitmarsh [18]), studies of personal traits and mediation (Brown et al. [19]; Twigger-Ross & Breakwell [20]), travel and tourism (Floyd et al. [21]), leisure activities (Creyer, Ross & Evers [22]; Fave, Bassi & Massimini [23]) and economic investment (Parhankangas & Hellström [24]). Extending the perspective, there are a number of studies investigating experience in relation health and illnesses (Absetz et al. [25]) and how risk is becoming an embodied part of the individual in late modernity (Green, Thompson & Griffiths [26]; Robertson [27]). Individual experiences are also quite common as a control variable in studies of risk perception (Olofsson & Öhman [28]; Olofsson & Rashid [29]).

These previous studies have focused either on the relation between the experience and perception of the same risk, such as cancer, or indirect experiences mediated through mass media, friends or relatives, and particular risks, such as gene technology. This study uses a different approach where the relation between previous experiences per se and the perception of different types of risk like lifestyle risks, known risks and dread risks is measured.

## 2. MATERIALS AND METHODS

The analyses use data from two Swedish cross sectional national surveys, ‘Society and Values’, that took the form of mail questionnaires conducted in the winters of 2005 and 2008 (see Olofsson & Öhman [28]). The reason for the inclusion of two years in the analyses was to increase the number of respondents. Particularly people with foreign backgrounds are often underrepresented in postal surveys, and, to be able to conduct multiple statistical analysis, it is important that the subgroups in the sample are large enough to be tested. To control for the possible differences between the two samples, due to the year when the survey was fielded, is controlled for in all analyses.

The data sets used in the present analyses comprise two representative samples of the Swedish population between the ages of 16 and 75. The two samples in the 2005 survey were a national random sample (n=2000, response rate

---

<sup>1</sup> There are also indications that on an organizational and societal level, “learning for experience” is difficult and that risk assessment is more reactive than proactive (e.g. Rodriguez et al. [3]).

59 %) and a local random sample of people living in three areas in Stockholm, Gothenburg and Malmö (n=750, response rate 39 %), all residential areas with a high proportion of inhabitants with foreign backgrounds. In 2008 there were two similar samples but a lower response rate (national random sample n=2000, response rate 41 %; local random sample n=750, response rate 25 %). The total number of respondents was 1,472 in 2005 and 951 in 2008. The marked decrease in response rate may have several explanations: fewer reminders were sent out and it has been noted that Swedes are increasingly unwilling to participate. Because of language problems and incorrect addresses, the response rate of the second sample was expected to be low. In both surveys the second sample was included to increase the number of respondents with foreign backgrounds. One large group of people of foreign background were those with origins in neighbouring Nordic countries, and it is known from earlier research that they do not differ significantly in risk perception from native Swedes (e.g. Olofsson & Öhman [30]) so these respondents were excluded. A small group of respondents originating from different Western European countries, Canada, and the US were also excluded for similar reasons. Remaining were 222 respondents in 2005 (114 women and 108 men) and 103 in 2008 (53 women and 49 men) with foreign backgrounds, predominately from the Middle East and the former Yugoslavia. The total number of respondents after these exclusion was 2,358.

The surveys included a large number of items based on earlier studies (e.g. Sjöberg [31]) and a pre-study of five focus-group interviews (Olofsson and Öhman [32]). Both waves focused on risk perception, risk communication, risk behaviour, experience, social resources, experiences, socioeconomic status and values. Identical questions from the two years about risks, worldviews and experiences were used in the current study.

The present study follows the design of previous risk perception studies so that a considerable variety of different risks could be investigated (for an overview see Slovic [7]). It is well-known that scholars usually do not observe individual "underlying" preferences or responses such as risk perception. Instead, such latent variables are observed only through discrete indicators. The question in the survey was "How big do you think the risk is for you personally to be injured by the

following?", and a number of different risks were presented. In this study, people's underlying perceptions of risks were observed through 12 questions about different kinds of risks: smoking, alcohol, violence, illness, stress, traffic accidents, transportation, natural disasters, climate change, terrorism, genetically modified organisms (GMO) and epidemics. The answers could vary according to five categories, 5 to 1 (Very big, Big, Moderate, Small and Very small), which are inherently ordered. It is well documented from earlier studies that people judge risk differently depending on the risk target: risk for others is perceived as larger than risk for the individual personally (Slovic [6]). In the surveys, questions of how people perceive risks for themselves personally are used. The 12 risks were categorized into three sets of risks: lifestyle risks (Cronbach's  $\alpha=.568$ ), known risks ( $\alpha=.756$ ) and dread risks ( $\alpha=.804$ ). These categories were not used as scales but rather only as analytical tools in the interpretation of the results.

Moving to the explanatory variables, previous experience of crises was measured by asking the respondents whether they had experienced, and were still affected by, any one of the different risks and, if so, if they had experienced them once or more often, using three response alternative no, yes once or yes several times. The survey participants were asked about experiences still affecting them regarding four different kinds of risks, serious illness, natural catastrophe, traffic accidents and violence and aggression. That means that it is the respondents self reported experience that still affect them in their lives that is measured.

Following previous studies, a number of control variables were used to ensure that the effects of experience were not artefacts of other explanatory variables. These variables were gender, age, origin, education and worldview. In cases where age has an significant effect, older people, for example, tend to worry more about illnesses and crime, while younger people perceive stress to be a greater risk (Slovic [33]). In other words, the effect of age depends on the kind of risk in question (Savage [34]). It is well documented that ethnic minorities and people with foreign backgrounds tend to rate risks as being higher than the majority and native people (Finucane et al. [35]; Flynn, Slovic & Mertz [36]; Olofsson & Rashid [29]). Origin was measured by asking the respondents about their own origin and that of their parents, and people who were born, or have at least one parent born,

abroad were considered to have a “foreign” origin.

Previous studies also indicate that people with higher education in general perceive risk as lower, although the kind of risk influences the perception. Studies from the US indicate that women are more influenced by education than are men (Hakes & Viscusi [37]). Furthermore, education can also be used as a proxy for income. In the survey, education was measured by a question asking what the highest level of education the respondent has, categorized in three levels – compulsory school, upper secondary school and university – and a fourth alternative: “Other education”. Worldviews were measured using a revised cultural theory (Dake [38]; Douglas & Wildavsky [39]) index composed of 16 questions, which were used as an explanatory factor (Rippl [40]). The index was analysed using principal component analysis and varimax rotation, giving the expected four factors (explained variance 0.436): fatalism, egalitarianism, hierarchy and individualism. Regression scores for each respondent were used in the statistical analyses.

Regression analyses (Ordinary Least Squares) were then used to analyse the relationship between experience and risk perception, controlling for gender, age, origin, education and values (using world views).

### 3. RESULTS

Before turning to the questions about the role of previous experience on risk perception, how the respondents perceived the different investigated risks in 2005 and 2008 respectively is shown (see Fig. 1).

#### 3.1 Risk Perception

The results were quite similar between the two years. Serious illnesses such as cancer and heart diseases followed by traffic accidents and stress are the hazards that people perceived as the biggest risks both in 2005 and 2008. However, in 2008 climate change “climbs” up to third place together with stress. One reason might be the media attention given to issues related to climate change during the time of the survey. Another reason might be that climate change more generally has become more of an issue on the public agenda. Other significant changes between the years are that risks related to natural disasters and transportation are perceived to be higher in 2008, while the threats from terrorism and epidemics are perceived to be lower. However, when ranking the risks, there were no other differences than that between climate change and stress. Terrorism together with smoking and epidemics are seen as the least risky for the respondents.

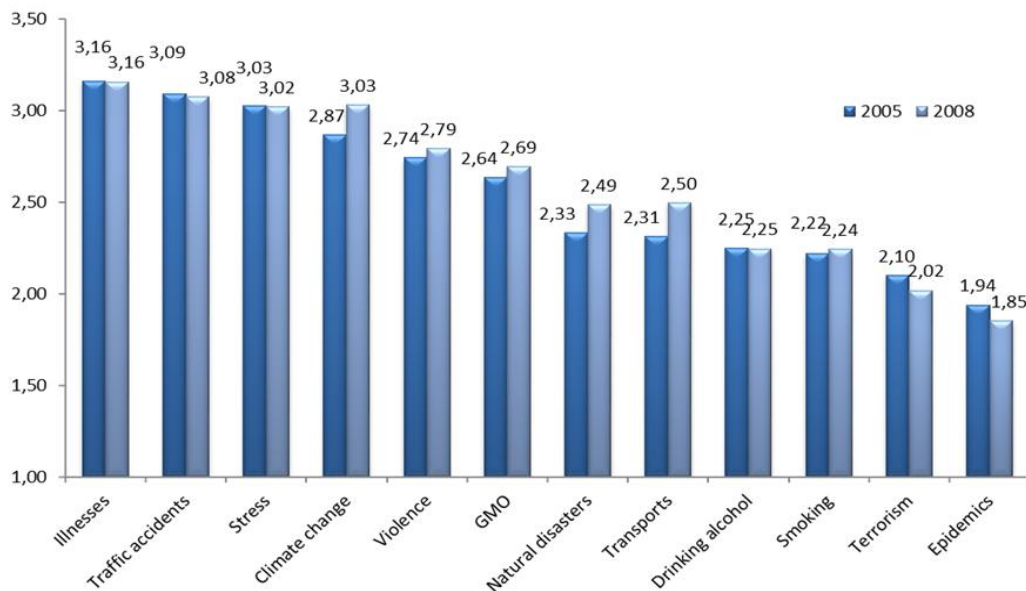


Fig. 1. Descriptive results for the perception of 12 different risks, mean on a scale ranging from 1 through 5 (note: the scale only shows 1-3.5)

Before leaving Fig. 1, there is one more thing that needs to be noted. The scale ranged from 1 through 5, and, as one can see in the figure, the higher mean scores are slightly higher than 3, that is, the middle of the scale corresponding to “moderate” risk. Hence, in general, people do not perceive the 12 different risks as particularly big for them personally.

Going back to the original questions regarding the effects of experience on risk perception, 12 multiple regression analyses (Ordinary Least Squares) were done to investigate these relationships. A number of control variables, including gender, age, origin, education and worldview, were also included in the analyses, and the results are presented below.

### 3.2 Experience and Risk Perception

The 12 different risks investigated are categorized into three sets of risks: lifestyle risks (smoking, alcohol and stress), known risks (illnesses, traffic accidents, transportation and violence) and dread risks (natural disasters, climate change, terrorism, GMO and epidemics). Three of the four experiences correspond to known risks, experience of traffic accidents, illnesses and violence, and one to dread risks, experience of a natural disaster. None of the experiences correspond directly to lifestyle risks, but there is a possibility that people with experiences of illnesses, such as cancer, might associate them with, for example, smoking.

There are some interesting patterns (see Table 1). As expected, people perceive risks that they have experienced to be higher than people without similar experiences. More interesting, however, is the effect of experience on other risk perceptions: People who have had experiences of violence and aggression perceive lifestyle risks and known risks to be comparably higher than other people. Having experienced a serious illness such as cancer or heart disease has a similar impact on lifestyle risks but not on known risks, except for risks related to illnesses and violence. Interestingly, experience of an illness is also related to higher perceptions of dread risks, such as climate change, terrorism and GMO.

A similar pattern is found for people who have experienced a traffic accident: they, too, perceive dread risks as comparably higher threats than

people without such experience. The experience of a traffic accident is, as expected, also related to risks associated with traffic and transportation, that is, known risks. Last of all, there is a small group of respondents (n=82) who had experienced some kind of natural disaster. The anticipated correlations with perceptions of dread risks, including natural disasters but also terrorism, GMO and epidemics, are significant, but there is also an association between this kind of experience and two of the four known risks: People with experience of natural disasters tend to perceive risks associated with transportation as well as with violence to be higher than other people.

As noted, the analyses also included a number of control variables; gender, age, origin, education and world views. Looking at the effects of these variables one can say that in general gender and origin has an impact on most of the different risk perceptions, as well as worldviews. The connection between education and risk perception is not that strong, it is more or less only lifestyle risks that are associated with education: People with compulsory school as their highest education perceive smoking and alcohol as a bigger risk compared to people with university or ‘other’ education. People with university education on the other hand perceive the risk of stress as higher than people with compulsory school education. Age is related to perception of some of the risks studied; smoking, stress, illnesses, transportation, terrorism and epidemics. In all cases, except risks associated with stress, older people perceive the risk as higher than younger people.

Taking a closer look at gender, it is found to be associated with all three categories of risk perceptions and all but two single risk perception items: traffic accidents and violence. Overall, women perceive risks, in general, to be bigger than do men, except risks associated with alcohol, which men perceive to be higher. Origin plays as significant a role as gender: it is associated with all three categories of risk perception and 10 out of 12 single risk perception items. Just as with gender, it is the perception of traffic accidents that does not differ. The second non-significant risk perception is that of climate change. In all other cases, people originating from a country other than Sweden perceive risks to be higher than people originating from Sweden.

**Table 1. 12 regression analyses of the relationship between risk perception and earlier experience, gender, ethnicity, age, education and values (standardized regression coefficients). No significant differences between the samples from 2005 and 2008. \*\*\*P=.001, \*\*P=.01, \*P=.05**

Explanatory	Traffic accident	Violence	Natural disaster	Illness	Gender	Age	Origin	Secondary	University	Other	Fatalist	Egalitarian	Hierarchy	Individualist	Adj. R <sup>2</sup>
<b>Dependent</b>															
<b>Lifestyle risks</b>															
1. Smoking	.012	.070**	.034	.052*	-.073**	.093***	-.134***	.000	-.097**	-.065*	.094***	.077***	-.033	.082***	.080
2. Alcohol	.030	.075**	.039	.025	.084***	.019	-.072**	-.042	-.083**	-.081**	.059*	.031	-.044	.085***	.052
3. Stress	.036	.132***	.012	.056*	-.121***	-.234***	-.075***	.054	.106***	.014	-.001	.045*	.057**	.048*	.119
<b>Known risks</b>															
4. Illnesses	.027	.090***	.029	.176***	-.076***	.126***	-.056*	.039	.074*	.024	.034	.010	.029	-.007	.071
5. Traffic accidents	.090***	.075**	.040	.039	-.008	-.007	-.039	.011	.014	.002	.047	.001	.055*	.014	.021
6. Transportation	.063**	.013	.083***	.043	-.051*	.177***	-.115***	.005	.032	-.007	.071**	.088***	.006	.030	.077
7. Violence	.050*	.176***	.078***	.046*	.036	-.037	-.085***	-.021	.052	.007	.067**	.017	.083***	.053*	.076
<b>Dread risks</b>															
8. Natural disasters	.067**	-.002	.136***	.039	-.118***	.047	-.187***	-.037	-.029	.012	.074**	.095***	.039	.038	.111
9. Climate change	.058*	.039	.057*	.073**	-.148***	-.043	-.041	-.002	-.012	.026	-.042	.059*	.000	.017	.051
10. Terrorism	.026	.064**	.104***	.072**	-.094***	.082***	-.210***	.000	.019	-.021	.125***	.030	.064**	.078***	.120
11. GMO	.068**	.045	.060**	.055*	-.116***	.015	-.096***	-.011	-.003	-.001	-.004	.084***	.022	.037	.045
12. Epidemics	.065**	.026	.079***	.065**	-.071**	.057*	-.172***	-.030	-.010	-.047	.096***	.031	.020	.050*	.076

Lastly, the relation between worldview and risk perception must be discussed. Here, the pattern is not as obvious as with the other explanatory and control variables. The four different worldviews – fatalist, egalitarian, hierarchy and individualist – are all associated with risk perception and some more than others. People with more fatalist worldviews are actually the ones that perceive most risks as high: they rated all lifestyle risks as well as risks related to transportation, violence, natural disasters, terrorism and epidemics higher than others. People with more egalitarian views of the world also perceive risks associated with smoking, transportation and natural disasters as high, together with climate change and GMOs. Hierarchical worldviews are associated only with perceptions of four risks: stress, traffic accidents, violence and terrorism. People with more individualistic worldviews perceive life style risks as relatively high together with violence, terrorism and epidemics.

#### 4. CONCLUSION

As expected, the results show that there is a clear relationship between experience and perception of the same kind of risk. For example, people with experience of traffic accidents also perceive risks of accidents in traffic to be higher than do others. In three out of four experiences, this is the strongest predictor. The question at the beginning of the article was whether there were some experiences that were more powerful than others, but the results did not indicate this. The results indicate that a specific experience does not influence all kinds of risk perceptions but is rather associated with particular categories of risk perception items and not others. Hence, the fact that experience has a large effect on risk perception is a particular interesting result. As noted previously in the article, experiences of traffic accidents and natural disasters show a similar pattern influencing perceptions of known and dread risks. Violence, on the other hand, influences perceptions of lifestyle and known risks, and previous experiences of illnesses influence perceptions of lifestyle and dread risks. What it is exactly that determines the effect of a specific experience on a category of risk perception is beyond the scope of this article but is clearly interesting and in need of further investigation.

Gender, age, origin, education and worldviews all relate to risk perception. Gender, it is found to be associated with all three categories of risk

perceptions and overall, women have a higher risk perception than men have, also in line with earlier studies (Finucane et al. [35]; Flynn, Slovic & Mertz [36]; Olofsson & Rashid [29]). Usually, older people tend to worry more about illnesses and crime, while younger people perceive stress to be a greater risk (Slovic [33]). The same pattern is found in this study (see also Savage [34]). Turning to origin, the pattern that people with foreign backgrounds perceive risks as being higher than native people, found in earlier studies is repeated (Finucane et al. [35]; Flynn, Slovic & Mertz [36]; Olofsson & Rashid [29]). The connection between education and risk perception is not strong in the study, only lifestyle risks are associated with education. Lastly, looking at the relation between worldview and risk perception, the pattern is not as obvious as with the other control variables. Fatalist, egalitarian, hierarchy and individualist world views are all associated with risk perception in expected ways but the relations are not so strong (Olofsson & Öhman [28]). It could be the limitation of the principal component analysis measuring world views, only having a explained variance of 44%. Overall the control variables used in the study is in line with earlier research in the field.

Looking at experience as a way to understand perception of risk is, from a sociological perspective, important, since the distribution of accidents, illnesses and experiences of other kinds of crises and disasters are not evenly distributed among people (Barnshaw & Trainor [2]; Morrow [3]; Rodriguez et al. [4]; Wisner et al. [5]). For example, gendered risks, such as violence in public places, are perceived as more risky by women, while crime statistics indicate that men have more experience of this kind of risk. Empirical studies also show that after a disaster, for instance, immigrants, single mothers, children and ethnic minorities are more affected and receive less help than other groups (e.g. Bolin [41]; Morrow [3]; Peacock, Morrow & Gladwin [42]). By investigating experience *per se*, it might be possible to get a better understanding of when inequality influences perception.

By focusing on the individual's experience, it is possible to identify patterns among people concerning the effect of experiences. Depending on previous experiences of certain hazards and crises, the individual's perception of risks related to these experiences will vary. This article has also shown that experiences is transferring the



feeling of dislike or fear not only to the related risk but also to other kinds of risk. The type of risk and transference needs to be more thoroughly explored to find the mechanisms involved (cp. Kahneman & Twersky [1]; Barnett & Breakwell [10]).

From a policy perspective, these results give new insights into the way in which experiences contribute to the understanding of risk perception, insights important for professionals working with risk communication and risk management. It is important to recognize that experiences can have wider implications for people's perceptions than previously known.

### **ETHICAL APPROVAL**

The survey study 'Society and Values' has been examined and approved by the appropriate ethics committee in Sweden.

### **ACKNOWLEDGEMENTS**

The author wish to thank the colleagues in RCR, for their helpful comments on an earlier draft of this manuscript, especially Professor Anna Olofsson. The author also wish to thank the anonymous reviewer who offered detailed comments and wise suggestions.

### **COMPETING INTERESTS**

Author has declared that no competing interests exist.

### **REFERENCES**

1. Tversky A, Kahneman D. Judgment under Uncertainty: Heuristics and biases. *Science*. 1974;185(4157):1124-1131.
2. Barnshaw J, Trainor J. Race class and capital amidst the hurricane Katrina diaspora. In D. L. Brunsma, D. Overfelt and J. S. Picou (Eds.), *The sociology of Katrina: Perspectives on a modern catastrophe*, Boulder: Rowman & Littlefield; 2007.
3. Morrow BH. Identifying and mapping community vulnerability. *Disasters*. 1999; 23:1-18.
4. Rodriguez H, Trainor J, Quarantelli EL. Rising to the challenges of a catastrophe: The emergent and prosocial behavior following Hurricane Katrina. *Annals of the American Academy of Political and Social Science*. 2006;604:82-101.
5. Wisner BP, Blaikie BP, Cannon T, Davis I. *At risk: Natural hazards, people's vulnerability and disasters*. 2nd ed. London: Routledge; 2004.
6. Slovic P. Informing and educating the public about risk. *Risk Analysis*. 1986;6: 403-415.
7. Slovic P. *The perception of risk*. London: Earthscan Publications; 2000.
8. Alhakami AS, Slovic P. A psychological-study of the inverse relationship between perceived risk and perceived benefit. *Risk Analysis*. 1994;14:1085-1096.
9. Kates RW. Assessing the assessors: The art and ideology of risk assessment. *Ambio*. 1977;6:247-252.
10. Barnett J, Breakwell GM. Risk perception and experience: Hazard personality profiles and individual differences. *Risk Analysis*. 2001;21(1):171-177.
11. Zinn JO. Heading into the unknown: Everyday strategies for managing risk and uncertainty. *Health, Risk & Society*. 2008; 10:439-450.
12. Giddens A. *Consequences of modernity*. Cambridge: Polity Press; 1990.
13. Luhmann N. Familiarity, confidence, trust: problems and alternatives. In D. Gambetta (Ed.), *Trust: Making and breaking cooperative relations*, electronic edition, 94-107. Oxford: Department of Sociology, University of Oxford; 2000.
14. Slovic P. Trust, emotion, sex, politics and science. *Risk Analysis*. 1999;19:689-701.
15. Mead GH. *The philosophy of the present* (A. E. Murphy, Ed.). Chicago: The Open Court Publishing Company; 1932.
16. McGee TK, McFarlane BL, Varghese J. An examination of the influence of hazard experience on wildfire risk perceptions and adoption of mitigation measures. *Society & Natural Resources: An International Journal*. 2009;22:308-323.
17. Mishra S, Suar D. Do lessons people learn determine disaster cognition and preparedness? *Psychology & Developing Societies*. 2007;19:143-159.
18. Whitmarsh L. Are flood victims more concerned about climate change than other people? The role of direct experience in risk perception and behavioural response. *Journal of Risk Research*. 2008; 11:351-374.
19. Brown AL, et al. Sexual victimization in relation to perceptions of risk: mediation, generalization, and temporal stability.

- Personality and Social Psychology Bulletin. 2005;31:963–976.
20. Twigger-Ross CL, Breakwell GM. Relating risk experience, venturesomeness and risk perception. *Journal of Risk Research*. 1999;2:73–83.
  21. Floyd MF, et al. The effect of risk perceptions on intentions to travel in the aftermath of September 11, 2001. *Journal of Travel & Tourism Marketing*. 2003;15: 19–38.
  22. Creyer E, Ross W, Evers D. Risky recreation: an exploration of factors influencing the likelihood of participation and the effects of experience. *Leisure Studies*. 2003;22:239–253.
  23. Fave AD, Bassi M, Massimini F. Quality of experience and risk perception in high-altitude rock climbing. *Journal of Applied Sport Psychology*. 2003;15:82–98.
  24. Parhankangas A, Hellström T. How experience and perceptions shape risky behaviour: Evidence from the venture capital industry. *Venture Capital: An International Journal of Entrepreneurial Finance*. 2007;9:183–205.
  25. Absetz P, et al. Comparative optimism in breast cancer risk perception: Effects of experience and risk factor knowledge. *Psychology, Health & Medicine*. 2000;5: 367–376.
  26. Green EE, Thompson D, Griffiths F. Narratives of risk: Women at midlife, medical 'experts' and health technologies. *Health, Risk & Society*. 2002;4:273–286.
  27. Robertson A. Embodying risk, embodying political rationality: Women's accounts of risks for breast cancer. *Health, Risk & Society*. 2000;2:219–235.
  28. Olofsson A, Öhman S. Vulnerability, values and heterogeneity: one step further to understand risk perception and behavior. *Journal of Risk Research*. 2015;18(1):2-20.
  29. Olofsson A, Rashid S. The white (male) effect and risk perceptions: Can equality make a difference? *Risk Analysis*. 2011; 31:1016-1032.
  30. Olofsson A, Öhman S. General beliefs and environmental attitudes: Trans atlantic comparisons. *Environment and Behavior*. 2006;38(6):768-790.
  31. Sjöberg L. Factors in risk perception. *Risk Analysis*. 2000; 20(1):1-11.
  32. Olofsson A, Öhman S. Views of risk in Sweden: Global fatalism and local control. An empirical investigation of Ulrich Beck's theory of modern risks. *Journal of Risk Research*. 2007;10(2):177-196.
  33. Slovic P. Do adolescent smokers know the risks? *Duke Law Journal*. 1998;47:1133–1141.
  34. Savage I. Demographic influences on risk perception. *Risk analysis*. An International Journal. 1993;13:413–420.
  35. Finucane ML, et al. Gender, race, and perceived risk: The 'white male' effect. *Health Risk & Society*. 2000;2:159–172.
  36. Flynn J, Slovic P, Mertz CK. Gender, race, and perception of environmental-health risks. *Risk Analysis*. 1994;14:1101–1108.
  37. Hakes JK, Viscusi WK. Dead Reckoning: Demographic determinants of the accuracy of mortality risk perceptions. *Risk Analysis*. 2004;24:651–664.
  38. Dake K. Myths of nature: Culture and the social construction of risk. *Journal of Social Issues*. 1992;48:21–37.
  39. Douglas M, Wildavsky A. *Risk and culture. An essay on the selection of technological and environmental dangers*. Berkeley, CA: University of California Press; 1982.
  40. Rippl S. Cultural theory and risk perception: A proposal for a better measurement. *Journal of Risk Research*. 2002;5:147–165.
  41. Bolin R. Disaster impact and recovery: A comparison of black and white victims. *International Journal of Mass Emergencies and Disasters*. 1986;4(1):35.
  42. Peacock WE, Morrow BH, Gladwin H, (Eds.). *Hurricane Andrew: Ethnicity, gender, and the sociology of disaster*. London: Routledge; 1997.

© 2017 Öhman; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

*Peer-review history:*

*The peer review history for this paper can be accessed here:*  
<http://sciedomain.org/review-history/21712>