

RISK PERCEPTION AND ACCEPTANCE CONCERNING WOLVES AND WILD BOARS IN THE NETHERLANDS



6/7/2012

Master's Thesis report

Author: Britt Tamar Stikvoort (890103 806 020)

Supervisors: Dr. M. Poortvliet (1st supervisor, Department of Communication Science)
Dr. B. Elands (2nd supervisor, Department of Forest and Nature Conservation Policy)

Wageningen University

COM – 80533 (Thesis Communication Strategies)

RISK PERCEPTION AND ACCEPTANCE CONCERNING WOLVES AND WILD BOARS IN THE NETHERLANDS

MASTER'S THESIS REPORT

Britt Tamar Stikvoort (890103 806 020)

Thesis submitted for the partial fulfillment of the MSc programme:

Applied Communication Science (MCS)

Supervised by:

Dr. M. Poortvliet (Department of Communication Science)

Dr. B. Elands (Department of Forest and Nature Conservation Policy)

June 2012

Wageningen University

The Netherlands

ABSTRACT

In the near future, wolves might enter the Netherlands and lawfully they cannot be barred. Moreover, they can be seen as threats for Dutch citizens, whom possibly overestimate these risks. On the other hand, wild boars, already prevalent in the Netherlands, induce risks that are underestimated by Dutch citizens. Nature managers will have to communicate with the public about nature policy, and for effective communication they will need to know about the public's risk perception and acceptance. This study aims to provide such insights, focusing on risks concerning wolves and wild boars. The study investigates – with two questionnaires ($N = 1024$ & $N = 214$) – if risk dimensions from previous research can be applied, and what the effects of objective and subjective vicinity, urbanity, and prior experience are on risk perceptions and acceptance. Results show that from a broad range of risk factors, two broader risk dimensions were distilled. Also, there was a trend towards a connection between objective vicinity and perceptions of wild boar risks. Subjective vicinity was related to acceptance of wild boar risks, but this was mediated by prior experience. The valence of prior experiences was related to risk perception and acceptance for both species. Finally, the impact of experiences was marginally significant to risk acceptance for wild boar risks. Insights of this study could be useful for nature managers' communication activities with citizens concerning wildlife-risks. Most applicable are the values people ascribe to wildlife experiences, and the link this has with risk perception and acceptance.

CONTENT

1	INTRODUCTION	5
1.1	PROBLEM STATEMENT	5
1.1.1	<i>Practical Issue.</i>	6
1.1.2	<i>Scientific Issue.</i>	9
1.2	THEORETICAL FRAMEWORK	9
1.2.1	<i>Risk perception literature.</i>	10
2	OVERVIEW OF STUDIES	14
3	RESULTS	15
3.1	PILOT STUDY	15
3.1.1	<i>Method.</i>	15
3.2	DISCUSSION PILOT STUDY AND INTRODUCTION TO MAIN STUDY	17
3.2.1	<i>Method.</i>	18
3.2.2	<i>Results.</i>	20
4	GENERAL DISCUSSION	29
4.1	PRACTICAL AND THEORETICAL IMPLICATIONS	31
4.2	STRENGTHS, LIMITATIONS AND FUTURE DIRECTIONS	32
4.2.1	<i>Limitations to the study.</i>	32
4.2.2	<i>Strong points and limitations of using APA formatting.</i>	33
4.2.3	<i>Three possible future research orientations.</i>	33
5	CONCLUSION	35
6	REFERENCES	36
7	APPENDIX	39
7.1	APPENDIX A: QUESTIONNAIRE	39
7.2	APPENDIX B: MAP OF OBJECTIVE VICINITY DISTINCTION	46
7.3	APPENDIX C: RESULTS OF LITERATURE STUDY IN MIND MAPS	47
7.4	APPENDIX D: ADDITIONAL ANALYSES	51
7.4.1	<i>Interesting findings not related to Hypotheses.</i>	51
7.4.2	<i>Risk Factor Analyses.</i>	52

1 INTRODUCTION

1.1 PROBLEM STATEMENT

“Wolves are gaining ground” is the title of an article in the Telegraaf, a Dutch newspaper (“Wolven rukken op”, 2012). Afterwards, another newspaper heads with “On the Veluwe you can easily harbour 5 wolf packs” (Beekmans, 2012). This illustrates how several newspapers see the relevance of a Dutch wolf comeback as a news item. The autumn before these articles were published, a wolf was allegedly spotted near two villages on the Veluwe. Questions in the governmental Chamber of representatives were raised; representatives were wondering what course of action the Dutch government would take, if wolves would re-enter the Netherlands. European law assigns a protected status to wolves (Trouwborst, 2010). However, does this mean that Dutch citizens need to fear for their own safety when they go out into the woods, once wolves have crossed the borders? Another issue that came to the attention of media is the possible threat of aggressive semi-domesticated wild boars, for instance in downtown Hamburg, Germany (“Everzwijnen in Hartje Hamburg”, 2012). Do Dutch nature managers have the task of eliminating such threats posed by wildlife? An important question is how people actually perceive the risks of wolves, wild boars and other wildlife, perceptions that depend on more than only objective probabilities. The main purpose of this study is to attend to the lack of insights on Dutch citizen’s risk perceptions and acceptance concerning wildlife species, particularly risks concerning wolves and wild boars.

Studying perception and acceptance of risks together in one study is something not often found in previous studies, but such a combination can be insightful. Risk perception can be defined as “*intuitive risk judgments*” (Slovic, 1987, p. 280) and risk acceptance as “*an acceptable balance of personal risks and benefits*” (Fischhoff, 1994, p.2). Risk acceptance is considered to be situation specific; there are “*no universally acceptable options*” (Fischhoff, 1984, p.3). Despite the difference, risk perception and acceptance do show a high, but inversed, relation with one another – high perceived risks relate to low acceptance of such risks. For instance, Fischhoff and colleagues found that factors underlying risk perception – such as perceived control, familiarity, immediacy and voluntariness – *also* influenced people’s risk acceptance, but inversely so (Fischhoff, Slovic, Lichtenstein, Read & Combs, 1978). Yet, high risk perceptions do not *automatically* lead to low acceptance; other factors play a role as well (Fischhoff, 1984). So, although the latter suggests that risk perception is just one of many factors influencing acceptance, most studies assume that acceptance emanates solely from perception, and consequently only focus on these perceptions. Therefore, they could unjustifiably omit other possible factors. In this study, a conscious decision was made to look at both perception and acceptance to ameliorate for this bias.

The issue of risk perceptions and acceptance has two sides or ‘applications’. On the one hand there is a practical side – nature managers’ need for insights into risk perceptions and acceptance of the Dutch public, to increase effectiveness of their management practices – and on the other hand there is a scientific side – furthering the research field on risk perceptions and acceptance.

Further on in this introduction, the problem statement is addressed by means of discussing both practical and scientific side of the issue. Thereafter, in the section ‘Theoretical Framework’, risk factors are discussed and particularly two are highlighted – a person’s vicinity to the habitat of a wild species and a person’s prior experience with the risky animal. Consequently, hypotheses are formulated, which are put to the test in two subsequent studies thereafter. First, though, the practical side is addressed below.

1.1.1 PRACTICAL ISSUE.

NEED FOR NATURE MANAGEMENT: WHAT TO DO WHEN THE WILD RETURNS?

The practical question that inspired this research proposal is: what to do when the wolf returns to the Netherlands? A second question that currently occupies nature managers also begs attention: what to do when the wild boar overruns our forests? (Groot Bruinderink & Dekker, 2010) Both wolves and wild boars can potentially harm humans, if they are provoked. Yet whether everyone shares the same notion on the harmfulness of these animals remains a question. In a country as densely inhabited as the Netherlands, where nature areas are multi-functional and shared among citizens for multiple purposes, approaching the return – or expansion – of large wildlife species is not only an ecological matter, it is a social issue as well. Thus, the issue merits an approach from a social perspective, especially if effective policy – which needs the mandate of the masses – is the final goal. Therefore this thesis aims to deal with the question: what are the public’s risk perceptions and acceptance concerning the wolf and wild boar?

The actuality of the issue is evident from recent wolf-sightings and the reaction of newspapers on this news. In 2011, people reported wolf-sightings on several occasions near the Dutch-German border. When these sightings reached the regional and even national news, many Dutch citizens were confronted with risks involved in the return of such a large carnivore as the wolf. This news coverage, and future appearances of wolves in the news, increases the need for nature managers to formulate a good communication plan concerning the risks of wolves; a plan that takes into account the perceptions of people concerning these risky animals. If not, risk perceptions may go ‘astray’ and all kinds of tall stories might emerge. Similarly, wild boars have been ‘in the news’ because of their rapid expansion in Dutch nature areas, their devastating effects to cultivated lands and the potential threat they pose to people (Pennings, 2012).

One important aspect to consider is that, due to their legal ‘protected status’, wolves cannot be banned from Dutch nature areas, whereas wild boars – not assigned such a protected status – can (Trouwborst, 2010). But since wolves and wild boars cannot read the law, it is up to nature managers to realize such population management, both the ecological management, and the communication of such actions towards civil society. In line with the multi-functionality of nature areas, people have a right to such information. But why would nature managers bother with values, opinions and perceptions of citizens, on the matter of wildlife?

RELEVANCY FOR NATURE MANAGEMENT.

Nature managers need the approval of the public – or at least absence of resistance – when managing nature areas effectively. Opposition from the public can cause ‘difficult procedural challenges’ when there is a discrepancy between the public’s risk perception, and that of managers (Gore, Knuth, Curtis & Shanahan, 2007a). People’s behaviour has been linked to risk perception in several studies, for instance ‘willingness to act’ (O’Conner, Bard & Fischer, 1999), ‘environmental practices’ (Baldassare & Katz, 1992) ‘health behaviour’ (Brewer et al., 2007) and ‘risk mitigation behaviour’ (Martin, Martin & Kent, 2009). Such behaviour is aimed at risk reduction, but if the public’s risk perceptions are not in line with managers’ risk perception, discrepancy can arise and this reduces management effectiveness. For making wildlife management effective, therefore, it is essential to develop plans that are in line with the risk perceptions and acceptance of the public (Decker, Lauber & Siemer, 2002; Gore et al., 2009).

Past case studies show that policy makers’ attempts to communicate with the public can influence their risk perceptions (for an overview, see Kasperson, Kasperson, Pidgeon & Slovic, 2005). So in order to work within the limits of public approval, it is pivotal for managers to communicate about risks, risk perceptions and risk acceptance, besides ‘routine’ technical management tasks. This applies for nature managers as much as for any other civil servant; an important step towards a publicly supported policy on large wildlife management therefore is the formulation of communication plans addressing wildlife risks. Formulating such plans requires first an understanding of the public’s perceptions concerning the risks involved (Gore et al., 2007a). In order to reach this understanding, this study investigated the public’s risk perceptions and acceptance of two large wildlife species – wolves and wild boars. The next two paragraphs explain first why particularly risk perceptions and acceptance of *Dutch* people are topic of this study, and consequently why particularly wolves and wild boars are examined.

NEED FOR COUNTRY-SPECIFIC INSIGHTS.

Apart from broad risk perception studies, scientific literature offers only few insights into wildlife specific risk perceptions, and no studies so far have specifically focused on the case of Dutch wildlife risks. This is particularly problematic for Dutch nature managers if they want to base their communication with the public on such insights; the use of literature from elsewhere may be of limited value. Because of high urbanisation levels, nature areas in the Netherlands do not contain large free-roaming wildlife, as in other countries or regions. Nature managers have only recently started to reintroduce large herbivores to some of the Dutch nature areas. Therefore many Dutch citizens are still quite inexperienced with the presence and potential encounters of such wild animals, whereas in other countries inhabitants have more exposure to wildlife. Several studies found that experience – exposure to wildlife – can have effects on fear and risk perception respectively (Johansson, Karlsson, Pedersen & Flykt, 2012; Thornton & Quin, 2010). The difference in levels of experience results in the inapplicability of insights from elsewhere to the Dutch case. Thus, country-specific knowledge is needed for Dutch nature managers. Consequently, the next paragraph argues why this study focuses on two species within this Dutch-specific context.

TWO SPECIES, ONE STUDY.

The news items that were discussed before already point towards the urgency of the issues revolving around wolves; people do seem to care about whether the wolf returns to the Netherlands. Yet, the wolf is not the only potentially dangerous large wild animal for Dutch citizens. Such safety concerns are illustrated by the city of Hamburg, Germany, which is currently experiencing harassment by a herd of wild boars (“Everzwijnen in Hartje Hamburg”, 2012). Maybe not as menacing and notorious in reputation as the wolf, wild boars can also inflict harm upon humans if they are provoked and sometimes even kill humans (Manipady, Menezes & Bastia, 2005). Yet, whereas there may be an overreaction concerning a potential re-emergence of the wolf in the Netherlands, risks for humans posed by wild boars are received with indifference at best, and disbelief at worst. Such indifference is a problem that nature managers have to deal with, in both technical management and in communication towards the public.

Wild boars are currently already causing several problems in rural and sub-urban areas, such as devastation of agricultural lands. Moreover, populations of wild boars are currently expanding in numbers and are spreading to non-nature areas, such as rural and sub-urban settings. This process is taking place across Western-Europe (Schley, Dufrêne, Krier & Frantz, 2008), however, it is notoriously difficult to contain wild boars to certain areas (Groot Bruinderink, 2008). Despite nature managers’ best efforts, wild boars are ‘roaming freely’ in areas where they are not wanted, as was the case in Hamburg. A similar difficulty is encountered with containment of wolf packs across Europe. Wolves seem to have no need for very large areas of undisturbed nature; they can – and sometimes do – live close to urbanised areas (e.g. in outskirts of Rome: Boitani, Fritts, Stephenson & Hayes, 2003).

Moreover, because both species are scavengers, they have the natural instinct to move to wherever they sense food can be ‘scavenged’, no matter if these areas are densely populated. Because human presence often goes hand in hand with waste disposal, it is even likely that these animals will be drawn to more populated areas. Both species can thus pose risks for people who live near the habitats of these animals, or people who want to visit such areas. Although both species are inherently shy and avoid human contact if possible, both are perfectly able to harm humans when they feel threatened. Therefore, they pose a risk for those who encounter them in the wild, especially for people with little experience on how to handle such wildlife encounters.

One important and evident difference between the two species is that wolves are not yet present in the Netherlands, whereas wild boars are. Moreover, wild boars do not suffer from the bad image that wolves have (Beekmans, 2012). Instead, wild boars are seen as a nuisance by farmers – wild boars tend to lay waste to agricultural lands – or as ‘cuddly’ animals by nature visitors (Groot Bruinderink et al., 2011). This latter image is the more troublesome, because seeing wild boars as harmless cuddly animals can induce risks when tourists start to approach wild boars with food and treats. The boars may get used to such treatment and lose their shyness, and consequently enter people’s gardens in search for more treats. This can cause dangerous situations, because when a wild boar feels threatened, it might attack and inflict severe damage. So, whereas the reputation of the wolf could be overly negative, the reputation of wild boars might be too positive, allowing for dangerous situations to arise. In order to communicate these risks, nature managers will first need to know people’s current risk perceptions and acceptance, so that they can respond accordingly. However, at the moment little is known about Dutch people’s risk perceptions and acceptance, as the subsequent paragraph will discuss.

1.1.2 SCIENTIFIC ISSUE.

WILDLIFE-RISK PERCEPTIONS: A KNOWLEDGE DEFICIT.

In the last few decades many studies into risk perceptions and acceptance have been conducted, but only few of these focused on wildlife related risks. No studies focused specifically on risk perceptions concerning wolves or wild boars in Europe. There are some reported studies into risk perception on other large wildlife in North America, for example concerning cougars (Thornton & Quinn, 2010, Zinn & Pierce, 2002) and black bears (Gore et al., 2006, 2007a, 2007b). North America is sparsely populated in comparison to Western European countries¹, so extrapolating from these studies should be done cautiously.

Additionally, there are several studies into public opinions on European wildlife, but these studies did not specifically focus on risk perceptions or acceptance. For instance, studies were done into factors that influenced people's attitudes towards -(Bjerke, Reitan & Kellert, 1998; Ericsson & Heberlein, 2003; Heberlein & Ericsson, 2005; Karlsson & Sjöström, 2007; Williams, Ericsson & Heberlein, 2002); social acceptability of - (Kleiven, Bjerke & Kaltenborn, 2004) and fear of - (Johansson & Karlsson, 2011) large wildlife species. Influential factors were for instance: experienced economic losses and personal control (Kleiven et al., 2004), personal experience with predation or hunting, having little knowledge of large wildlife species and having received a rural upbringing (Ericsson & Heberlein, 2003) indirect experience (Karlsson & Sjöström, 2007) and closeness to the area where the animal in question habited (Ericsson & Heberlein, 2003; Karlsson & Sjöström, 2007)². For a more extended overview of factors influencing attitudes on wildlife, the interested reader is referred to Appendix C, Mind map 3. However, it is clear that two central themes emerge from the above summation of factors; both closeness to – and experience with – the risky animal seems to play an important role in attitudes towards the animal in question. However, fact remains that no risk-perception research was published concerning large wildlife species in Europe. And although attitudes and risk perception are linked concepts (Sjöberg, 2000a, 2000b), they are not identical, and should not be used interchangeably. Thus, there is a lack of studies into risk perceptions among Europeans concerning large wildlife species, which this thesis aims to overcome by investigating just that: risk perceptions and acceptance concerning wildlife in the Netherlands.

1.2 THEORETICAL FRAMEWORK

Due to this knowledge gap, species-specific studies into risk perception and acceptance were not available to use in a theoretical framework, which is why the theoretical background supporting this study is based on findings from both research into perceptions on other risk topics, and from research into wildlife attitudes. The field of research into risk perception covers a broad range of risks, and has revealed the influence of many different aspects – or factors – to both risk perception and acceptance. This sub-section presents only those factors, theories and research that were used as theoretical framework in this study. For a more elaborate overview of factors influencing risk perception and acceptance, both general and for ecological risks specifically, the reader is referred to Appendix C, Mind map 1 and 2 respectively.

¹ Average population density of Western Europe is 171 inhabitants/km² whereas in Northern America this is 16 inhabitants/km² (UN Statistics, 2010).

² The mentioned concepts are formulated such that a high score on the concept corresponds to more negative attitudes on/less acceptance of the animal in question.

1.2.1 RISK PERCEPTION LITERATURE.

Past research – focusing on various risk topics – resulted in insights on factors that influence people’s risk perception and – to a lesser extent – acceptance. Broadly two types of factors can be distinguished: a) factors that differ between risks b) factors that differ between persons. The former factors are often referred to as ‘risk factors’ – such as novelty of the risk and size or impact of the consequences – whereas the latter are ‘individual factors’ – such as personality characteristics and socio-demographics. Both are of interest to this study.

RISK FACTORS.

One of the major models focusing on risk factors originates from the psychometric paradigm. This approach used numerous potential factors that seem to influence risk perceptions, and consequently merged these many factors into a few overarching dimensions. Dread and Newness of risks are two dimensions³ that are often found in such studies (Fischhoff et al., 1978; Slovic, 1987, 1999). One important insight from such studies is that lay-people base their risk perceptions on different factors than experts do. Factors like controllability, voluntariness, dread and if a risk is familiar are important to risk perceptions of lay-people (Trimpop, 1994). Such factors can be divided into a Dread dimension, containing factors adding to how dreadful people think the risk is, and a Newness dimension, containing factors on how novel and unknown people judge a risk to be.

In these past studies, risk dimensions were investigated and found for a very broad range of risks; this makes it plausible that the same risk dimensions will also explain risk perceptions concerning wolves and wild boars. Therefore, it is hypothesised that the risk dimensions originating from psychometric studies –specifically those mentioned in Slovic (1987) – are also applicable to risk perceptions of wolf or wild boar encounters. To test this assumption, this study aims to replicate the dimensions found in Slovic (1987), a Dread dimension and a Newness dimension. The following Hypothesis will be tested:

- 01.** Risk factors relevant for the risks posed by wolves and wild boars can be classified into a Dread dimension containing dread-related factors and a Newness dimension containing newness-related factors.

INDIVIDUAL FACTORS.

Whereas psychometric research aimed at explaining risk factors, other studies focused more on individual factors: differences between people that can explain their different risk perceptions. These studies yielded weaker results than psychometric studies (for instance: Barnett & Breakwell, 2001; Kallmen, 2000; Sjöberg & Wåhlberg, 2002), probably because there are many potential individual factors involved in risk perception and acceptance. However, many

³ These terms might be confusing, since the terms ‘dread’ and ‘newness’ are also often used as factors. However, the dimensions Dread and Newness are broader than the factors dread and newness. The dimension Dread contains the factor dread, but also many other factors. To prevent conceptual confusion, whenever talking about dimensions, Dread and Newness are capitalized to emphasize their ‘overarching’ character.

individual factors were found to have some influence, nonetheless. Socio-demographic factors - age, gender, income, education, religion - are often found to influence risk perceptions. For instance, being male, white and having a high income or education level all adds to reduced risk perceptions and increased risk acceptance (Finucane, Slovic, Mertz, Flynn & Satterfield, 2000). Other individual characteristics that have been studied are for instance: anxiety (Kallmen, 2000); new age beliefs (Sjöberg & Wåhlberg, 2002); personal experience with the risk (Barnett & Breakwell, 2001); worldviews and personal norms (measured on Schwartz's Personal Norm Scale) (Slimak & Dietz, 2006; Willis & DeKay, 2007); trust in industry or in other people (Sjöberg & Wåhlberg, 2002); aesthetics of the environment where the risk takes place (Willis, DeKay, Fischhoff & Morgan, 2005) and experience with the risk (Barnett & Breakwell, 2001; Kellens, Zaalberg, Neutens, Vanneuville & De Maeyer, 2011) (see Appendix C for a more elaborate and schematic overview).

The above summation presents the multitude of individual factors, which could even be supplemented farther by potential other factors from wildlife attitude-research, mentioned earlier on. From this wide range of factors, there are two of particular interest to the case of wolves and wild boars: vicinity to the animal's natural habitat, and prior experience people have with wildlife. Both people's vicinity and prior experience differ for risks of wolves and wild boars respectively. Dutch citizens are 'closer' to wild boars - who already roam the Dutch countryside, whereas wolves do not. Secondly, Dutch citizens have - chance to - experience wild boars; for wolves they do not. Both constructs are inspected more closely, below.

Vicinity

Firstly, several studies incorporated some form of proximity measurement and found this to be linked to attitudes or risk perception concerning wild animals (Ericsson & Heberlein, 2003; Karlsson & Sjöström, 2007; Teigen, 2005; Thornton & Quinn, 2010). One can distinguish between actual and perceived closeness of people towards wild animals, as well as the level of urbanity of their living environment. It is likely that in line of previous findings, vicinity influences Dutch citizens' risk perception and acceptance towards risks concerning wolves and wild boars. However, this assumption has not been tested yet in Europe, let alone a Dutch setting, nor has it been tested for risks concerning wolves and wild boars.

People's actual proximity to wild animals - or their 'objective vicinity'- was shown to influence the attitudes on wolves of Swedish inhabitants (Karlsson & Sjöström, 2007). Whether such objective vicinity also influences risk perceptions of Dutch citizens is something this study aims to investigate. Moreover, currently there are no published studies that measure subjective - self-reported - vicinity of wildlife risks. Yet, a study into people's perception on risk probabilities found that proximity, or 'subjective vicinity' influences such risk probability estimates (Teigen, 2005); the more proximate a risk was, the higher its probability was judged to be. However, whether this also counts for wildlife risks remains unanswered. Thus, both objective and subjective vicinity merit an investigation, to see whether these influence people's risk perceptions and acceptance concerning wolves and wild boars.

In case of objective vicinity, the question remains which areas in the Netherlands are 'objectively close' to habitats of wild boars and wolves. Currently wild boars are allowed to roam freely only in two nature areas in the Netherlands, the Meinweg in Limburg, adjacent to the German border, and the Veluwe in Gelderland (Groot Bruinderink et al., 2010). Moreover, if the wolf enters the Netherlands, it will most likely do so via Germany. If it decides to stay, this will most likely be in the Veluwe, where it can nourish itself on the bountiful wild herbivores (Beekmans, 2012;

Huizenga, Mölling & Hoof, 2010). Because both species thus are most probable to have their habitats near the German border or on the Veluwe, this will be considered as 'objectively close', whereas other areas in the Netherlands are considered less so. This has led to the following Hypothesis:

02. People living closer to the German border or close to the Veluwe have a higher risk perception and lower risk acceptance of risks concerning wolves/wild boars.

It could be argued that, because the Netherlands has such a small area of nature lands, roughly the entire country is 'objectively close' to the wolf and wild boar, since both can survive in semi-urban settings. Additionally, the wolf can travel up to 50 kilometres in one night in its search for food (Boitani, 2003, p.119). Instead, what may be more relevant for people's risk perception is not so much their objective vicinity, but their perceived closeness to habitats of these animals. According to Teigen (2005) more proximal risks are perceived as more probable. However, this was investigated for traffic accidents, which are rather different risks than those posed by wildlife. Therefore, subjective vicinity will be tested with the following Hypothesis:

03. People who consider themselves to live closer to a wolf/wild boar habitat have a higher risk perception and lower risk acceptance of risks concerning these animals.

A third approach to vicinity is to look at urbanity of people's living environment. Many studies found that urbanity influenced attitudes towards wild animals, the more 'urban' people lived, the more positive they were towards these animals (Bjerke et al., 1998; Karlsson & Sjöström, 2007; Kleiven et al., 2004; Williams et al., 2002). Thornton & Quinn (2010) found that risk perceptions of Canadians concerning cougars was positively related to the proximity of respondents to urban areas, which suggests that urbanity indeed could influence risk perceptions. In order to see if this effect also matters for Dutch citizens, the following Hypothesis was postulated:

04. People who consider themselves to live in urban areas have a lower risk perception and higher risk acceptance of risks concerning wolves/wild boars.

Insight into all three vicinity measures can be useful for nature management. For instance, if objective vicinity is an important factor to risk perception or acceptance, then communication efforts can have a primary emphasis on the areas that are likely the first to encounter the risks involved. If perceived vicinity or urbanity matters to risk perception or acceptance, then efforts can be made to enhance or reduce these perceived levels of vicinity or urbanity, or the assumptions underlying it (for instance, living in urban areas safeguards one from wolf-encounters).

Prior experience

Secondly, whether or not people have prior experience⁴ with risk topics, this can influence risk perceptions (Barnett & Breakwell, 2001). Prior experience is found to influence attitudes of people towards wildlife, whether experience is indirect (Karlsson & Sjöström, 2007) or direct, and whether it originates from hunting or victimization by a wild animal (Ericsson & Heberlein, 2003) or from suffered economic losses (Kleiven et al., 2004). Thus, experience with wildlife can be an important factor for risk perceptions and acceptance.

⁴ Experience in this study is interpreted as exposure to wildlife.

Experience is related to one’s vicinity to nature areas, since people who live in the vicinity of the habitats of wildlife are more probable to have actual encounters – experience – with animals (Ericsson & Heberlein, 2003). However, experience is not completely dependent on vicinity, because wildlife encounters can also originate from daytrips into nature areas, or encounters on the road; both situations do not require a person to actually ‘live’ close to the habitat of the risky animal. Moreover, experiences from others can also influence people’s attitudes towards wildlife (Karlsson & Sjöström, 2007); this may also be the case for risk perceptions or acceptance concerning wildlife.

In their study on prior experience on risk perceptions, Barnett and Breakwell (2001) distinguish between three aspects of experience – quantity, impact and valence – and found that experience had explanatory power “over and above the more commonly used predictor variables of gender and perceptions of “dread” and “knowledge” (Barnett & Breakwell, 2001, p. 176). They found that higher risk perceptions were linked to increased frequency of experience, higher reported impact of the experiences and a more negative value judgement of the experiences. In line with these findings, the following three Hypotheses were postulated:

- 05. People with more prior experience with wildlife encounters have higher risk perceptions and lower risk acceptance of risks concerning wolves/wild boars.
- 06. People whose experiences had big impacts on them have higher risk perceptions and lower risk acceptance of risks concerning wolves/wild boars.
- 07. People who judge their experiences more negative have higher risk perceptions and lower risk acceptance of risks concerning wolves/wild boars.

Model.

The suggested model is visualised in Figure 1 below. It presents Hypothesis 1 to 7.

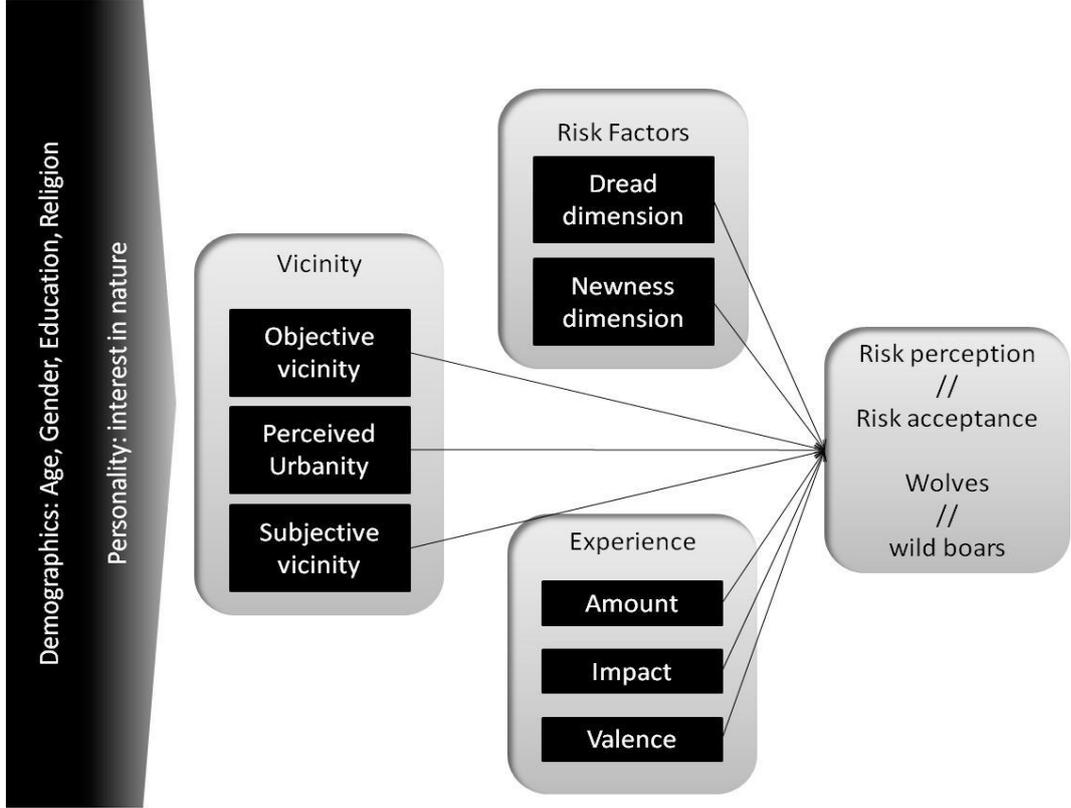


Figure 1: Schematic overview of proposed Model of this study.

2 OVERVIEW OF STUDIES

This research aimed to investigate the relation between vicinity to wolf or wild boar habitats and prior experience with wildlife on the one hand, and risk perception and acceptance of risks concerning wolves and wild boars on the other hand by means of two subsequent questionnaire studies. Because the division of the concept 'prior experience' into quantity, impact and valence has not been tested before in a Dutch setting, a pilot study was done first to test whether this distinction was capable of explaining risk perception and acceptance on a wide range of risks. Based upon findings from this pilot study the three-fold division of the concept 'prior experience' was used for the subsequent main study. In this latter study, experience, subjective and objective vicinity and urbanisation were operationalized in a questionnaire on risks concerning wolves and wild boars, in order to test Hypotheses 2-7. In addition, risk factors from Fischhof (1978) were translated and used for testing of hypothesis 1. Below, the results from the pilot study will be presented, firstly, followed by a brief discussion and consequently the main study results.

3 RESULTS

3.1 PILOT STUDY

3.1.1 METHOD.

PARTICIPANTS AND PROCEDURE.

The pilot study was part of a university course where students handed out questionnaires on a risk topic of their choosing. In total more than a thousand people, contacted in public places, responded to these questionnaires ($N = 1024$), divided over ten risk topics with approximately a hundred respondents per topic.

MEASURES.

Socio-demographics and control variables. Socio-demographics were measured to control for differences, by entering gender (0 = male, 1 = female), age (in years), religiousness (0 = no, 1 = yes) and education (four-options multiple choice) as covariates in the analyses. Additionally, two control variables on personal characteristics were measured; knowledge on the risk topic (mean score on 5 knowledge true/false questions) and innovativeness of the respondent (computed average on two statements on the willingness to try out new products and on pioneering in use of new technologies; 1 = totally disagree, 7 = totally agree).

Risk perception. Risk perception was measured with two seven-point scale items. Respondents were asked about how safe they thought the situation was (1 = extremely unsafe, 7 = extremely safe), and how risky it was (1 = very risky, 7 = totally safe). The responses had a high scale reliability ($\alpha = .83$). An average score of both items was computed and used for further analysis. The scale was inversed for ease of interpretation; high scores on the scale equal high risk perceptions.

Risk acceptance. For risk acceptance again two 7-point scale items were used. Respondents were to state their agreement or disagreement (1 = totally disagree, 7 = totally agree) on two statements; first a statement about whether the risk in question is acceptable, secondly a statement similar to the first, but with a synonym instead of the term 'acceptable'. Responses had a high scale reliability ($\alpha = .87$). An average score of both items was computed and used for further analysis.

Experience. In line with Barnett and Breakwell (2001) three questions were asked about the experience people had with the risk-topic of the questionnaire. All three questions were based on self-reported experiences of respondents, and were measured on 7-point scales. The first question tapped into the amount of experience people had with the risky item or situation (1 = very little, 7 = a lot). Secondly respondents were asked about the impact of these experiences on their lives (1 = very small, 7 = very big). Thirdly, there was a question on whether these experiences were received as more positive or more negative (1 = very negative, 7 = very positive).

RESULTS.

Demographics were close to the average Dutch society, although complete representativeness cannot be claimed on basis of the results. The percentage of women in the sample was 54.8%, which is more than the average in Dutch society (50.5%, CBS (2012)), and the average age of the sample was lower than the average of 39 years in Dutch society ($M_{age} = 31.38$, $SD_{age} = 15.31$, ranging from 11 to 82). Approximately 58% of the respondents said they were non-religious and about 43% claimed to have obtained higher practical or academic levelled education.

In order to test the applicability of prior experience into a three-fold question – for the sake of answering Hypotheses 5-7 in the main study – two-step linear regression analyses were conducted, with risk perception and acceptance as dependent variables. Table 1 presents the results of the two hierarchical regression analyses. Two steps were included in the regression analyses: in the first step demographics were entered – age, gender, education and whether people were religious or not. Additionally, two personal trait-like variables were entered: a measurement of how innovative people judged themselves to be and a measurement of how much they knew about the risk in question. The second step in the regression analyses introduced the three variables on experience. The adjusted R^2 in the regressions indicated that this second model explained 11.7% of the variance in risk perception ($R^2=.12$, $F(8,946)=16.752$, $p<.001$) and 12.9% of the variance in risk acceptance ($R^2=.13$, $F(8,950)=18.72$, $p<.001$). Thus, the variables on experience added 7% and 6% respectively to the explained variance of the regression models on risk perception and acceptance.

Table 1: *Results of Regression Analyses (Pilot study; N = 1024)*

Step and Variables	Risk perception		Risk acceptance	
	1	2	1	2
1. Gender	-.05	.04	-.10**	-.09**
Age	.18***	.14***	-.22***	-.19***
Education	.02	.02	-.09**	-.09**
Religious	.05†	.05	-.05	-.05
Innovativeness	-.09**	-.09**	.00	.00
Knowledge	.07*	.07*	.13***	.11***
2. Experience – amount		.06		.06
Experience - impact		.12**		-.07†
Experience - valence		-.24***		.22***
ΔR^2	.05	.12	.08	.14
Adjusted R^2	.05	.12	.07	.13

Note to Table 1. Standardized regression coefficients are reported for the respective regression steps. Step 1 includes socio-demographics, Step 2 includes socio-demographics and three questions on experience. † $p < .05$ (one-tailed test); * $p < .05$ (two-tailed test); ** $p < .01$ (two-tailed test); *** $p < .001$ (two-tailed test).

In the second step, risk perception and acceptance were both influenced by age – older people judged risks to be higher, and less acceptable – but gender and education only influenced risk

acceptance –lower educated men accepted risks more than higher educated women. This confirms earlier findings from risk perception studies on the ‘white male effect’ (e.g. Finucane et al., 2000). Both innovativeness and knowledge of respondents were significant predictors for risk perception; both characteristics added to reduced risk perceptions. Furthermore, having more knowledge also predicted finding risks more acceptable. However, both constructs were oriented towards risks concerning *man-made* products; these constructs are less applicable to the risk studied in the main study, which is a *natural-borne* risk.

From the three questions on prior experience, the valence of prior experiences emerged as the strongest of the three items. Valence was highly significant for both risk perception and acceptance, with more positive experiences predicting lower risk perception and more acceptance. Additionally, the height of impact of experiences was a significant predictor for risk perception but only marginally significant for acceptance. This indicates that when impacts of experiences are higher, people perceive risks as riskier, and there is a trend towards less acceptance. The item on the amount of experience predicted neither risk perception nor acceptance.

3.2 DISCUSSION PILOT STUDY AND INTRODUCTION TO MAIN STUDY

Firstly, the above discussed pilot study was useful in discovering whether asking about people’s risk perception and acceptance with a two-item question was warranted. There was a high reliability between the two items for both constructs, yet also significant differences between their means. In other words, people judged the two items to be different from one another, yet their answers on both items were highly related, giving reason to use the two items’ averages as a single measure for risk perception and acceptance respectively. This is in line with recommendations from Gliem and Gliem (2003) who state that reliability of multi-item questions is considerably higher than single-item questions. Therefore, in the main study this procedure was repeated.

Moreover, the pilot study showed how the amount of experiences with a risky product or situation had no influence on people’s risk perceptions and acceptance, but that qualitative aspects of such experiences – level of impact and value ascribed to the experiences – did. However, despite that the data from the amount of experiences does not produce significant results, it is difficult to omit this question in a questionnaire; it would make a questionnaire needlessly difficult to comprehend if respondents are straightaway asked about qualitative aspects of experiences without first asking if they had prior experiences or not in the first place. Therefore all three items on experience were used in the subsequent main study.

Additionally, personal characteristics such as innovativeness and knowledge were found to be important contributors to risk perception and acceptance. But because innovativeness and knowledge are less applicable traits to the risks concerning wildlife, it was decided to adopt a personal trait concerning the natural risks specifically. A previously studied construct focusing on environmental orientation (New Ecological Paradigm Scale) was found to be relevant for ecological risk perceptions (Slimak & Dietz, 2006; Willis & DeKay, 2007). Because the NEP scale is a 16-item scale it was too long for adoption in this questionnaire. Instead, a shorter construct measuring a person’s interest in nature was adopted, as will be explained in the upcoming main-study section.

The main study focused on the effect of experience quantity and quality – impact and valence – on Dutch citizens’ risk perceptions and acceptance concerning wolves and wild boars. The effect of experience was subject of Hypotheses 5-7. In addition, the first Hypothesis about dimensions of risk factors, and Hypotheses 2-4 on vicinity to wildlife areas, were investigated in this study.

3.2.1 METHOD.

PARTICIPANTS AND PROCEDURE.

The questionnaire was handed out in public transport; travellers were approached with the request to complete a seven-page paper questionnaire taking about 15 minutes on ‘nature perceptions’. In return for participation respondents had a chance to win one of ten book-coupons. The full questionnaire in this study can be found in Appendix A. In total 214 people completed a questionnaire in public transport in the Netherlands (of which 48.6% were female; $M_{age} = 39.06$, $SD_{age} = 18.80$, ranging from 17 to 86). Of the people reporting on religion ($N=206$) 47.2% were religious – either Roman Catholic, Protestant, Muslim or ‘other’. Higher, middle, lower and primary education were completed by 52.2%, 39.2%, 7.2% and 1.4% of the respondents, respectively.

MEASURES.

Socio-demographics and control variable. Socio-demographic and control variables were measured to control for differences, by entering gender (0 = female, 1 = male), age (in years), religiousness (0 = no, 1 = yes) and education (4-options multiple choice) as covariates in the analyses. Moreover, a personal trait relevant to the natural risks of wildlife – interest in nature – was measured by means of a 3-item question. Respondents were asked whether they were interested in wild animals (1 = not at all, 7 = very much so), whether they liked to go to nature areas to see such wild animals (1 = not at all = 1, 7 = very much so) and whether they visited nature areas often (1 = not at all = 1, 7 = very often). The reliability for these three items was high ($\alpha = .86$). Therefore, an average of all three items was computed for further statistical analysis.

Objective vicinity. In order to objectively measure how close people lived to the German border – from where wolves are likely to enter the Netherlands – people were asked to report the first two digits of their postal code. No more than two digits were asked in order to accommodate respondents’ privacy. With these digits the respondents’ data was split up into two groups, one living closer to, the other farther away from the German border or the Veluwe. This division was based on three criteria. The first criterion was direct adjacency of the postal area to the German border. Respondents with postal codes directly adjacent to the German border were coded with “1”. Secondly, all postal areas that had areal within 20 kilometres of the German border were coded “1”. Thirdly, because wolves are most likely to inhabit a large nature area close to the German border, such as the Veluwe, if they cross the border, all postal areas that had areal within the Veluwe were included in the code “1” as well. Postal areas that met none of these criteria were coded “0”. In appendix B an image is included showing the division of the Netherlands based on these criteria.

Subjective vicinity. Respondents were also asked how close they judged themselves to live near areas where wolves or wild boars respectively could live, in comparison to the average Dutch citizen (1 = much closer, 7 = much farther away). For ease of interpretation, this scale was inversed during the data analysis, so that high scores on this scale correspond to high perceived 'closeness'.

Urbanity. To measure whether respondents judged themselves to live either in an urban or a rural setting, a question was asked on whether respondents thought they lived in an urban area or in a rural area (0 = rural, 1 = urban).

Experience. In line with the results of the pilot study, the construct experience was measured with three items, one pertaining to *amount of experience* (1 = experience at all, 7 = very frequent experience), a second to the *impact of the experience* (1 = very little impact, 7 = very big impact), and a third to the *valence of experiences* (1 = very negative, 7 = very positive). Because each item is about a different aspect of experiences (quantity, impact and valence respectively) the items were not averaged into one variable but were treated separately.

Risk perception. Questions on risk perception and risk acceptance were preceded by the short description of a scenario of potential risk-encounters. Respondents were asked to envision the scenarios as if they were really happening, and consequently answer the questions. Each scenario was followed by two-item questions on both risk perception and acceptance. The first three scenarios dealt with wolf-encounters, in a garden, on the road and during a nature hike respectively. The following three scenarios were similar, but instead of wolves they dealt with wild boar-encounters. The entire questionnaire is added in appendix A. Risk perception was measured with a similar two-item scale that was used in the pilot study. Respondents were asked whether they judged the scenario safe or not, and risky or not respectively (1 = safe/unrisky, 7 = unsafe/risky respectively).

Risk acceptance. Directly following the question on risk perception for each scenario a two-item question concerning risk acceptance was asked. Respondents were asked whether they thought the risk in the scenario was acceptable or not – using a different Dutch term that is a synonym for the word 'acceptable', for the second item (1 = completely acceptable, 7 = completely unacceptable). For ease of interpretation, this scale was inversed during the data analysis, so that high scores on the scale equal high risk acceptance.

Risk factors. In order to check whether risk factors could be classified into two dimensions, a Dread dimension containing dread-related factors and a Newness dimension containing newness-related factors (Hypothesis 1), nine risk factors were translated from Fischhoff et al (1978) and adopted in the questionnaire. The following nine risk factors were used: voluntariness ("Do you have the feeling you are voluntarily exposed to the risk?"); immediacy ("Do you feel that you will experience the consequences of this risk very directly?"); knowledge of exposed ("Do you think that you know enough about this risk?"); knowledge of science ("Do you think science knows enough about this risk?"); control ("Do you feel you have control over how much risk you are running?"); newness ("Is this risk new to you?"); chronic/catastrophic potential ("Is this a risk that only a few people are exposed to, or many?"); common/dread ("When you think about the risk, can you stay calm about it or do you experience a feeling of dread?") and finally severity of consequences ("How fatal do you think are the consequences of

this risk?"). Answer options were seven-point scales ranging from one extreme to the other (e.g. in the first question: 1 = completely voluntary, 7 = completely involuntary).

3.2.2 RESULTS.

DESCRIPTIVE STATISTICS AND CORRELATIONS.

Table 2 shows the mean scores, standard deviations and correlations for all socio-demographics, control variables and the three measurements for both vicinity and prior experience. A first particularity is that men perceived less risks and found the risks more acceptable, concerning both species. Similar significances in correlations were found for age, except for risk perceptions concerning wild boars, where no significance was found. Education correlated only to risk perception and acceptance of wolves, but not to those concerning wild boars, and religion had similar correlation patterns. Thus, high education and non-religiousness correlated to lower risk perceptions and higher risk acceptance, but only in the case of risks from wolves, not in the case of risks from wild boars.

Table 2 also suggests that risk perception and acceptance are highly correlated. High risk perception correlated strongly to low risk acceptance. This suggests that indeed risk perception and acceptance are highly related to one another, as prior research has suggested (Fischhoff et al., 1978).

Additionally, subjective vicinity to both wolf and wild boar habitats was highly correlated to objective vicinity. This means that people living closer to the German border or the Veluwe actually perceived themselves to be closer to potential wolf and wild boar-habitats. Moreover, subjective vicinity was negatively correlated to urbanity; rural inhabitants felt to live closer to wildlife habitats.

From the three questions on experience, both amount and valence were significantly correlated to risk perception and acceptance concerning both animals, but impact of experiences was not. However, whether the constructs vicinity and experience were sound predictors for risk perception or acceptance required further regression analyses. First, however, the nine risk factors that were topic of the first Hypothesis, are addressed in factor analyses.

Table 2: Pearson Correlations Among variables measured in the Main Study (N = 214)

	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1 Gender	.51	.50															
2 Age	39.06	18.80	.08														
3 Education	3.42	.69	.11	-.18**													
4 Religious	.49	.50	-.13	.29***	-.23**												
5 Interest in nature	4.87	1.48	.10	.14*	.15*	-.03											
6 Objective vicinity	.51	.50	-.06	-.06	-.05	.01	.15*										
7 Urbanity	.59	.49	-.05	-.20**	.20**	-.15*	-.13	-.38***									
8 Subjective vicinity – wolf	4.00	2.05	.10	.01	-.06	.06	.24**	.53***	-.43***								
9 Subjective vicinity – wild boar	4.17	2.06	.09	-.01	-.12	.06	.29***	.53***	-.41***	.88***							
10 Experience – amount	3.21	2.04	.18**	-.12	.06	.02	.43***	.15*	-.13	-.28***	-.36***						
11 Experience – impact	3.87	1.72	.05	-.01	-.01	-.06	.32***	-.03	.01	-.04	-.07	.47***					
12 Experience - valence	4.70	1.49	.20**	-.19*	.14*	-.17*	.37***	.12	.00	.19**	.18**	.52***	.33***				
13 Risk perception - wolf	4.91	1.13	-.23**	.15*	-.16*	.17*	-.24***	-.07	.00	-.08	-.04	-.22**	-.10	-.31***			
14 Risk acceptance – wolf	3.83	1.39	.25***	-.28***	.21**	-.23**	.34***	.20**	.00	.20**	.20**	.34***	.10	.42***	-.66***		
15 Risk perception – wild boar	4.32	1.28	-.18**	.04	.01	-.03	-.18*	-.23**	.12	-.19**	-.19**	-.24***	-.03	-.30***	.44***	-.46***	
16 Risk acceptance – wild boar	4.39	1.47	.23	-.18	.09	-.12	.28***	.18**	-.03	.22**	.25***	.40***	.11	.44***	-.38***	.74***	-.70***

Note to Table 2. * $p < .05$; ** $p < .01$, *** $p < .001$ (2-tailed), SD means Standard Deviation.

FACTOR ANALYSES.

The first Hypothesis predicted that from nine risk factors adopted from Slovic (1987), two dimensions – Dread and Newness – could be identified. Factor analyses were performed for wolves and wild boars separately. Because the measured risk factors and the dimensions they would form into were likely related to one another, oblique rotations were most appropriate as a rotation method (Field, 2009, p. 644). Therefore Direct Oblimin was used, with the selection of components – also known as dimensions – based on Eigenvalues greater than 1 and a clear point of inflexion in the scree-plot. When the number of factors is less than 30, this is an accurate approach (Field, 2009, p. 641). In both cases, this led to the identification of two components, also called ‘dimensions’. According to Stevens (2002) for samples greater than 200 respondents, factors loadings should be greater than .364 for inclusion of a factor onto a component. The pattern matrix was used for the analysis of the results, as is suggested in Field (2009, p. 666) because it gives insights into the unique contributions of each variable on the components of the analysis.

In the scree plot for the factor analysis concerning wolves a point of inflexion was seen after the second component/dimension. Thus, two dimensions were distinguished in the risk factors concerning wolves. Nearly all factors loaded on the first dimension: voluntariness, knowledge of those exposed and of scientists about the risk, control, catastrophic potential, dread and severity of consequences. Apart from the two factors on knowledge, the first dimension corresponded with the Dread-dimension found by Slovic (1987). Onto the second dimension voluntariness also loaded, but inversely so, as well the factors (not dimensions) newness and dread, the only positive contributor was immediacy. Two of these – immediacy and newness – correspond to the second Newness dimension found in Slovic (1987). The other factors, however, belong to Slovic’s first dimension, and were in this analysis found to also load on the first dimension. No exact replication of the dimensions of Slovic (1987) could therefore be obtained. The left columns of Table 3 give the factor loadings for the two dimensions on risk factors concerning wolves.

Table 3: *Pattern Matrix of Factor Analysis concerning wolves and wild boars*

	Components for wolves		Components for wild boars	
	1	2	1	2
Voluntariness	.41	-.45	.62	
Immediacy of consequences		.84		.91
Knowledge of exposed	.67		.67	
Knowledge of science	.58		.61	
Control	.70		.78	
Newness		-.46	.46	
Catastrophic potential	.69		.43	
Dread	.50	-.42	.56	
Severity of consequences	.55		.64	

Note to Table 3: Rotation method: Direct Oblimin, Eigenvalues > 1. Loadings > 0.364 are noted.

The same procedure was also followed for the risk factors concerning wild boars, of which results are shown in the right two columns of Table 3. An even sharper point of inflexion was observed in the scree plot right after the second component, so again two components/dimensions were taken into consideration. The first dimension contained all risk factors except for immediacy of consequences. The second component only loaded immediacy of consequences, in the traditional Newness dimension found by Slovic this is accompanied by the two risk factors on knowledge, and the factor newness. Thus, the results did not correspond fully with the dimensions of Slovic (1987) and therefore, Hypothesis 1 is rejected. However, to check whether the dimensions found could be interpreted as 'belonging to one dimension', the reliability between these factors was investigated.

For the first dimensions of both wolf and wild boar risks, Chronbach's Alphas were computed to see whether the factors were consistent among one another. For the first dimension on wolf risks, the Chronbach Alpha was moderate ($\alpha = .733$). This score could not be improved by deleting factors from the dimension nor by adding the factors immediacy and newness – from the second dimension. In the case of the first dimension of wild boars – which contained all but the immediacy factor – Chronbach's Alpha was also moderate ($\alpha = .744$); deleting or adding factors could again not improve the reliability of this scale. This suggests that the factors in the first of both the wolf risks and wild boar risks were reliable as one dimension, and adding or subtracting factors from these dimensions would not increase their reliability; these factors could be taken together as a multi-item measure.

OBJECTIVE AND SUBJECTIVE VICINITY AND URBANITY.

Hypotheses 2 to 4 concerned the effect of respondents' objective and subjective vicinity to wolves and wild boars, and their perceived urbanity in relation to risk perception and acceptance of these species. In order to test these Hypotheses, four hierarchical regression analyses were conducted; two regression analyses for wolves, and two for wild boars, with as dependent variables risk perception and acceptance respectively. Each regression analysis consisted of two steps. In the first step socio-demographic variables were entered in order to control for relationships with these variables and others. The interest in nature variable was entered as a personality trait in this first step as well. In a second step, the variables measuring urbanity, subjective vicinity and objective vicinity were entered.

In Table 4 the results of these regression analyses are presented (step 1 and 2 are shown in the first and second column of each of the 4 analyses). The adjusted square R-values indicate that the second model with the three items on vicinity explained 11.2% of the variance in risk perception concerning wolves ($R^2 = .11$, $F(8,182) = 4.00$, $p < .001$) and 31.2% of the variance in risk acceptance concerning wolves ($R^2 = .31$, $F(8,180) = 11.66$, $p < .001$). Concerning wild boars, the second model explained 7.4 % of variance in risk perception ($R^2 = .08$, $F(8,182) = 2.89$, $p < .01$) and 17.0% of the variance in risk acceptance ($R^2 = .17$, $F(8,181) = 5.83$, $p < .001$).

For risks concerning wolves, neither risk perception nor acceptance was predicted by the three variables of vicinity. Correlation Table 2 however suggested that both objective and subjective vicinity were highly correlated to acceptance of wolf-encounter risks. The correlations suggested that both actual closeness to the German border or the Veluwe, and perceived closeness to wolf habitats were positively related to risk acceptance. No correlation between urbanity and risk perception or acceptance was found, and in the regression analysis indeed urbanity did not

contribute either to risk perception or acceptance concerning wolves. Yet, the significant correlations found in Table 2 – between vicinity and risk acceptance – were not found in the regression analyses in Table 3, which suggests that the correlation found in Table 2 was mediated by other variables.

The regression analyses on wild boar risks resulted in (marginally) significant findings for objective and subjective vicinity as predictors to risk perception and risk acceptance respectively. First of all, objective vicinity was a marginally significant predictor of risk perception; living closer predicted lower risk perceptions. Secondly, subjective vicinity significantly predicted risk acceptance; feeling closer to a wild boar habitat corresponded to more acceptance of risks concerning wild boars. Again, the variable measuring urbanity had no predictive power over either risk perception or acceptance.

These findings suggest that – in line with Hypothesis 2 - objective vicinity to the German border or the Veluwe influenced risk perceptions, but the direction of this influence was in contrast to what was expected. The Hypothesis proposed that objective vicinity would increase risk perceptions, whereas the findings from the regression analysis suggest that risk perceptions were actually lower for those living closer to the German border or the Veluwe. This was only the case for wild boar risks, but not for risks concerning wolves; objective vicinity did not have any influence on either risk perception or acceptance concerning wolf risks.

Hypothesis 3 – stating that subjective vicinity will increase risk perceptions and decrease acceptance – was confirmed partly. In case of wild boars, the perceived closeness of people to the animal's habitat predicted acceptance of risks posed by the animal. However, again the direction of the influence was counter to what was hypothesized; increased subjective vicinity was related to more, rather than less, risk acceptance. Again, no results were found for risks concerning wolves.

Finally, Hypothesis 4 concerning self-judged urbanity of people had no significant effect on risk perception or acceptance, for either species. Thus, this Hypothesis is not supported by this study; urbanity – measured by asking participants to fill in their self-perceived level of urbanity – does not influence risk perception or acceptance directly.

The lack of significant findings for wolf related risks suggests that an influence of 'actual encounters' might be important, and that effects of vicinity are mediated by these experiences. Therefore, the construct of 'experience' was also measured and analysed in the same regression analyses, in order to see whether it had a mediating effect on the constructs of vicinity. The next section will dive deeper into the findings from this third set of questions on prior experience.

Table 4: Hierarchical Regression Analyses on Risk perception and acceptance concerning wolves and wild boars

Step & Variables	Risk perception - Wolf			Risk acceptance - Wolf			Risk perception - Wild boar			Risk acceptance - Wild boar		
	1	2	3	1	2	3	1	2	3	1	2	3
1. Gender	-.22**	-.22**	-.18*	.25***	.25***	.22***	-.20**	-.20**	-.14†	.23**	.20**	.15*
Age	.19**	.19*	.13†	-.36***	-.33***	-.28***	.12	.10	.02	-.27***	-.24**	-.15*
Education	-.04	-.04	-.04	.04	.05	.04	.06	.03	.05	-.03	-.01	-.03
Religious	.09	.10	.10	-.06	-.07	-.07	-.10	-.09	-.07	.03	.02	.00
Interest in nature	-.21**	-.20**	-.12	.38***	.35***	.29***	-.19*	-.14†	-.04	.30***	.25**	.15†
2. Objective vicinity		.00	.00		.09	.09		-.14†	-.14†		.04	.03
Subjective vicinity		-.02	.00		.07	.05		.02	.03		.18*	.12
Urbanity		.03	.03		.05	.05		.07	.07		.06	.06
3. Experience - amount			-.05			.04			-.14			.15
Experience - impact			.03			-.08			.12			-.13†
Experience - valence			-.17*			.17*			-.22**			.22**
ΔR^2	.148	.149	.176	.326	.341	.364	.079	.113	.169	.177	.205	.265
Adjusted R^2	.125	.112	.125	.308	.312	.325	.054	.074	.118	.155	.170	.219

Note to Table 4. Standardized regression coefficients are reported for the respective regression steps.

Step 1 including socio-demographics, Step 2: “...” and 3 questions on vicinity, step 3: “...” and 3 questions on experience

† $p < .05$ (one-tailed test); * $p < .05$ (two-tailed test); ** $p < .01$ (two-tailed test); *** $p < .001$ (two-tailed test).

PRIOR EXPERIENCE.

In order to test the Hypotheses on experience – amount of experience, impact and valence – the four regression analyses discussed above and shown in Table 4 were expanded with a third step, containing three experience variables: amount, impact and valence.

Table 4 presents the results of these regression analyses in the third column of each set of regression analyses. The results of the regressions indicated that the third model with the three items on experience explained 12.5% of the variance in risk perception concerning wolves ($R^2 = .13$, $F(11,179) = 3.42$, $p < .001$) and 32.5% of the variance in risk acceptance concerning wolves ($R^2 = .33$, $F(11,177) = 9.22$, $p < .001$). When comparing these results to the explained variance of the first step in the regression – which covered only demographics and interest in nature – there is no improvement in explained variance for risk perceptions, but there is an increase of 1.7% in explained variance for risk acceptance. This means that for acceptance of wolf-related risks the addition of prior experience and vicinity variables increased the model's explanatory power.

For wild boars, the third model explained 11.8% of variance in risk perception ($R^2 = .12$, $F(11,179) = 3.30$, $p < .001$) and 21.9% of the variance in risk acceptance ($R^2 = .22$, $F(11,178) = 5.82$, $p < .001$). When comparing these results with explained variance from the first step on demographics, the third model concerning risk perception has an increase of 6.4% in explained variance and concerning risk acceptance there is an increase of 6.4% as well.

Hypothesis 5, which predicted that with more prior experiences risk perceptions would be higher, and acceptance lower, was not supported by these findings and Hypothesis 4 must therefore be rejected based on these results. The amount of people's experiences with wildlife did not directly affect risk perceptions nor risk acceptance concerning wolf or wild boar risks.

Hypothesis 6, concerning the influence of impact of experiences on risk perception and acceptance resulted in marginal significance only in case of risk acceptance concerning wild boars. Impact of experiences was no predictor to risk perception, nor to acceptance of wolf-risks. The results therefore only partly support Hypothesis 6; that at least for wild boar risks, the larger the impact of experiences with wildlife encounters the lower people's risk acceptance is.

For both species, the valence of prior experiences was found to significantly predict both risk perception and acceptance. With negatively valued experiences come higher risk perceptions and lower acceptance. This is completely in line with what was proposed by Hypothesis 7.

Despite the lack of findings from Hypothesis 5 concerning amount of experiences, experience may be a candidate for mediating the link between subjective vicinity and risk acceptance. In order to investigate this, supplementary analyses were done as discussed below.

SUPPLEMENTARY ANALYSES.

Table 4 illustrates how the beta coefficients of subjective vicinity dropped after adding experience constructs to the regression. This suggests that one of the three constructs of prior experience might mediate between subjective vicinity and risk perception and acceptance. When living near wildlife habitats, the chance of experiencing wildlife encounters is bigger, so on average those who live closer could have more experiences with wildlife. Rather than living in the vicinity, the experience with wildlife – and aspects of that experience – may be more

important for risk perception or acceptance. Vicinity of people to wildlife habitats would in that case only indirectly influence risk perception and acceptance. The regression analyses support this suggestion; when the three variables on experiences were added in the third regression step, the subjective vicinity beta coefficients changed in all regressions, and in the case of acceptance of wild boar risks it reduced significance to insignificance.

Independent T-tests were done to see if aspects of people’s prior experience differed for people who perceived themselves to live closer than average to wolf or wild boar habitats. The respondents’ data was divided into two groups, one scoring high, the other scoring low on subjective vicinity. Consequently for these two groups the average scores on the three experience variables were compared. *Experience amount* was indeed higher for those who judged themselves living closer than average to wild boar habitats ($M = 3.64$; $SD = 2.10$) than the farther away group ($M = 2.63$; $SD = 1.81$). This difference was significant ($t(206) = 3.64$, $p < 0.001$). Similar results were found for differences in amount of experiences in the case of wolf habitats; those living closer by had more experience ($M = 3.62$; $SD = 2.16$) compared to those who answered that they lived farther away ($M = 2.68$; $SD = 1.75$). Again, the difference was significant ($t(207) = 3.38$, $p < 0.01$). No significant differences were found for the other two experience measurements – impact and valence – when comparing the two ‘subjective vicinity’ groups.

In order to explore whether experience amount was indeed a mediating variable, a Sobel Test was done (Baron & Kenny, 1986) for the mediating effect of experience amount concerning risk acceptance of wild boars, because this was where the variable of subjective vicinity was reduced to insignificance by adding experience to the regression. The Sobel test turned out to be significant ($z = 2.12$, $p < 0.05$). This mediating effect as well as the significant beta-coefficients for other variables are schematically displayed in Figure 2 below.

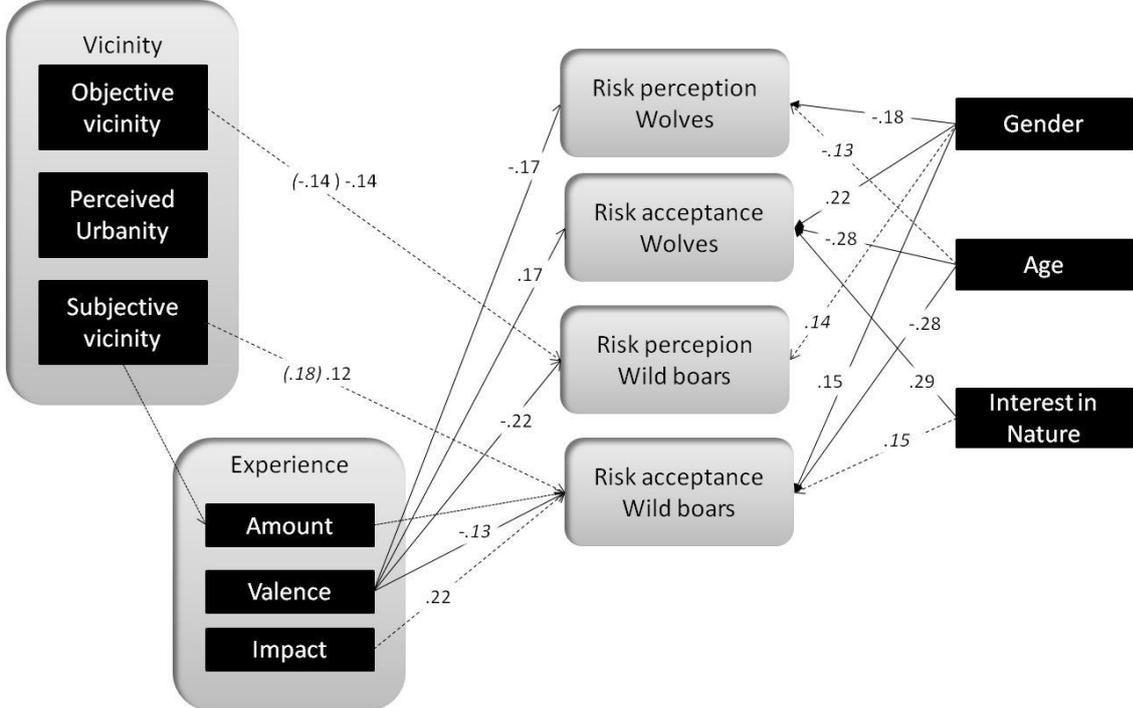


Figure 2: Schematic overview with beta coefficients from the regression analyses. Solid arrows are significant ($p < 0.05$), dashed arrows marginally significant ($p < 0.10$).

Another finding that merits some supplementary attention is related to the construct of interest in nature, which had very significant and high beta-coefficients in the regression analyses. Because no Hypothesis was formulated to investigate this construct further there will be no statistical analysis to explore these findings, but given the significant results it was judged unfair to leave them unmentioned. Therefore, interest in nature is discussed briefly below.

When looking at Table 3 it becomes apparent that the beta coefficients of interest in nature drops firstly after adding vicinity variables, and even more after adding prior experience variables. In the case of risk perception the latter reduction even results in a loss of significance; a p value lower than 0.05. This suggests that the variable is related to – and possibly even mediated by – the variables on vicinity and experience. When looking at the correlations in Table 2 this suggestion is corroborated; interest in nature is highly correlated to particularly subjective vicinity ($r(214) = .24, p < .01$ and $r(214) = .29, p < .001$ for wolves and wild boars respectively) and to all three of the experience constructs ($r(214) = .43, p < .001$ for amount of experience, $r(214) = .32, p < .001$ for impact of experience and $r(214) = .37, p < .001$ for valence of experience). These correlations and the drop in beta coefficients after entering vicinity and experience variables in the regression analyses, suggests that the relationship between interest in nature and risk perception and acceptance is mediated by both subjective vicinity and experience. However, especially for acceptance, interest in nature remains a significant predictor even after adding vicinity and experience variables in the regressions, so even if interest in nature is mediated by vicinity and experience, this is only partly so.

Because the suggested mediating effects are expected to be highly complex due to multiple possible mediators – both subjective vicinity and the three constructs on experience could play a mediating role – in this paper no further statistical analyses are done. This requires formulation and testing of additional Hypotheses on this topic. Suffice to say for this supplementary analysis-section, is that interest in nature has a very strong influence on risk perception and even more so on risk acceptance concerning both wolves and wild boars, both by mediation via other variables, as well as by directly affecting risk perception and acceptance.

4 GENERAL DISCUSSION

The first Hypothesis focused on reproducing the risk dimensions of Dread and Newness. However, in the main study, the exact replica of these was not possible in case of risk factors measured for wild boar- and wolf risks. Thus, as Hypothesis 1 could not be confirmed, the two dimensions found by Slovic (1987) seem not to be universally applicable to all risks. Yet, both risk topics did produce two distinctive dimensions which were noteworthy predictors of both risk perception and acceptance. So even though the exact dimensions of Slovic (1987) were not found, this does suggest that – in line with the approach of psychometric studies – a few overarching dimensions can be distilled from a range of ‘factors’ of risks. These dimensions were found to be strongly related to both risk perception and acceptance. This latter finding corroborates the idea that risk perception is related to risk acceptance, and that factors for risk perception are also factors for acceptance of that risk.

An explanation for not finding Slovic’s exact dimensions could be that in the main study only two very specific risk topics were investigated, whereas Slovic’s (1987) prior factor analyses were done with data on many different risks. Although the questionnaire tapped into different scenarios in which the risks could occur to replicate this diversity, maybe this was not enough to mimic the very diverse risk topics addressed in original psychometric studies. Moreover, those risk topics from prior research were acknowledged by most people as ‘risky’, such as risks of radiation and flooding. It might be the case that the risks concerning wildlife in this study were not considered ‘risks’ by some respondents. The risks of wildlife were not compared to other more ‘common’ risks, such as radiation risks, which could be interesting for further research.

The second dimension of both factor analyses contained the risk factor ‘immediacy of consequences’ with extremely high factor loadings, which is a peculiarity that merits an explication. A reason for this finding may lie in the questionnaire itself. People were first asked to ‘imagine an actual encounter’, followed by some questions, and consequently they were asked to think about the ‘*possible risk* of encountering a wolf/wild boar’, after which the risk-factor questions were asked. It could be the case that respondents were still thinking of the actual encounter, rather than the ‘*potential risk* of encountering’. If this is true, then the question on ‘immediacy’ would have made little sense to respondents; it asked people whether they considered the consequences of the risk to be immediate or delayed in time. If people were still thinking in terms of standing ‘face-to-face’ with an animal, then logically the consequences would be immediate and not delayed in time. The confusion concerning this question could therefore have partially caused the extremely high loading⁵.

None of Hypothesis 2 to 4, concerning people’s vicinity to the risk – objective or subjective vicinity, or perceived urbanity – were confirmed by this study. Subjective vicinity was only related to wild boar risk acceptance, but after considering experience the relationship between subjective vicinity and acceptance disappeared. Only a weak relationship was found between objective vicinity and risk perception, again only for wild boar risks. A possible reason why no relationships were found between wolf-related risks and subjective vicinity may lie in the fact that the wolf does not yet inhabit Dutch nature areas, and that people are aware of this. Each

⁵ Because this was not additional to answering Hypothesis 1 a further analysis into the possible effects of this confusing question was not adopted into this research paper. The interested reader is therefore referred to Appendix D for a deeper analysis of what happens when the factor ‘immediacy’ is left out of the equation.

person feels equally distant to these wolves, being abroad and not in the Netherlands. People could be convinced of this, since newspapers framed the topic of wolves entering the Netherlands as such; they were depicted as 'newcomers' and thus 'from abroad'. Thus, many Dutch people may be aware that the wolf is not yet living in the Netherlands, and this could have affected their scores on the scale of perceived vicinity. This suggestion is supported by the fact that subjective vicinity did relate to risk perception and acceptance for wild boar risks, but not for wolf risks.

A finding that merits more attention is that the connections between vicinity and risk perception and acceptance were reversed to what previous literature suggested and the Hypotheses posited. In Teigen (2005) for instance, proximity to a risky situation or topic led people to estimate probabilities of risks as higher than to risks that were less proximate. In line with this, it was proposed in Hypothesis 2, that people living closer to the German border – where wolves could be expected to enter the Netherlands – or to the wild boar habitat on the Veluwe⁶, would have higher perceptions on the risk. Moreover, Hypothesis 3 proposed that perceived closeness or 'subjective vicinity' would affect risk perception in a similar manner. Because risk perceptions are inversely related to risk acceptance (Fischhoff et al., 1978), these Hypotheses were extended to predict the reversed connection with risk acceptance; vicinity would lead to lower acceptance levels. Moreover, urbanity was found to influence attitudes (Bjerke et al., 1998; Karlsson & Sjöström, 2007; Kleiven et al., 2004; Williams et al., 2002) and even risk perceptions (Thornton & Quinn, 2010), which is why Hypothesis 4 postulated that with increased urbanity risk perceptions would decrease, and acceptance would increase. Yet, this study could not replicate any of these results concerning links between urbanity and risk perception or acceptance, and only very weak relationships between both objective and subjective vicinity and risk perception and acceptance. The weak relationships that were found, moreover, were opposite to what was expected; risk perception was lower for those living close to the Veluwe or the German border, rather than higher, as was expected in Hypothesis 2. Similarly, subjective vicinity to wild boar habitats had a positive relationship with risk acceptance, rather than the hypothesized negative relationship. Finally, adding experience variables made these connections even weaker.

One explanation for the lack of connection between vicinity and risk perception and acceptance lies in the potential mediating influence of prior experience. Further testing corroborated this suggestion; when the amount of prior experience was added in the regression, the predictive power of subjective vicinity dropped considerably in the case of acceptance of wild boar risks. This was not the case for objective vicinity, which suggests that objective vicinity is not mediated by experience. It could be that people infer their subjective vicinity-judgment from prior experiences, and also infer risk perceptions and acceptance towards wildlife from the same prior experiences.

Both the main study and the pilot study showed the great influence of the valence of prior experiences on risk perception and acceptance. Moreover, impact of experiences was related to risk perceptions in the pilot study as well, but not in the main study. This suggests that especially the way people value their prior experience, and to a lesser extent the impact of such experiences, are aspects of prior experiences that influence risks concerning wildlife – shown in the main study – and also for a diversity of other risks – as shown in the pilot study. This

⁶ The other area where wild boars roam freely is the Meinweg. This area is located within the first criterion of 'closeness to German border' which is why it is not mentioned as a separate criterion for 'objective vicinity'.

corroborates findings from Barnett & Breakwell (2001) who also found that impact and valence of experiences were the two most relevant aspects of experience for the prediction of risk perception for a broad range of risks.

Additionally, two other findings merit mentioning. Firstly, this study showed that factors influencing risk perception also mostly influenced risk acceptance and that the two – perception and acceptance – were highly but inversely correlated to one another. Secondly, the study showed that the measure on interest in nature was an important determinant to both risk perception and acceptance, one that might merit future investigation.

4.1 PRACTICAL AND THEORETICAL IMPLICATIONS

This study showed that the dimensions of Dread and Newness are not universally applicable to all risk topics, but that the idea of identifying a few dimensions for risk perception and acceptance is viable. Perhaps the dimensions of Dread and Newness can be found on aggregate levels incorporating many different risks, but not on a risk-specific level, such as was the case in the main study. Unfortunately the risk factors from the main study were not measured in the pilot study, due to restrictions in length of the questionnaire. This could have allowed for a better understanding of the potential of finding risk dimensions when different risks are considered. However, it is clear that risk factors were highly correlated with one another, and clusters of risk factors, called ‘dimensions’ could be distinguished, although they do not necessarily correspond exactly to the Dread and Newness dimensions of Slovic (1987).

Objective vicinity did not seem to affect people’s risk perceptions or acceptance, and neither did self-reported urbanity. In case of the latter variable, it might be interesting to investigate whether a stronger relationship emerges when a more objective measurement of urbanity is used. For instance, by asking people for their full postal code, a more objective distinction between urban and rural living conditions could have been made, which might have resulted in more relevant findings. Subjective vicinity was connected to risk acceptance, but was mediated partly by experience. In terms of theoretical implications, the findings from the main study indicate that the relationships between vicinity and attitudes, found in prior research concerning wildlife cannot be extrapolated to risk perception or acceptance without first investigating these relationships further.

Additionally, another theoretical implication is that this study suggested the mediating influence of experience to the relationship between vicinity to wildlife habitats and risk perception and acceptance. People who judged themselves to live closer to wild boar or wolf habitats actually also had more experience with wildlife encounters. Such prior experience, and specifically the way these experiences are valued by people, did influence risk perceptions and acceptance concerning wildlife, the more positive these experiences were, the more accepted the risks, and the less risk was perceived. Future studies ought to dive deeper into this before a sound theoretical framework can be based on the connections between these separate but related constructs of vicinity, experience and risk perception and acceptance.

Practical implications of this study are that nature managers now have a body of knowledge available concerning factors of risk perceptions and acceptance that are country- and species specific. The results of both the pilot and the main study showed that especially the value people assign to prior experiences is an influential factor for risk perception and acceptance. This

suggests that nature managers could try to influence risk perceptions and acceptance by offering people possibilities to have positive encounters with wildlife and by attempting to make such experiences either positive or negative. Such experiences need not be personal, however, since people are also often very influenced in their perceptions by others (Bonninger et al., 1995). Hearing others' experiences or learning from others via the media was related to people's attitudes and knowledge towards wolves (Karlsson & Sjöström, 2007, Hook & Robinson, 1982) and could maybe also be linked to people's risk perceptions and acceptance.

The factor interest in nature was not part of a formal hypothesis in this study but findings about it may still guide future communication efforts between nature managers and the public. People's interest in nature influences how acceptable they judge the risks of encountering wildlife. An entry point for nature managers might be to aim for an increase in people's interest in nature, thus increasing public acceptance concerning wolf-related risks, so that the public will be less opposed to the possible future of wolves crossing the border.

4.2 STRENGTHS, LIMITATIONS AND FUTURE DIRECTIONS

This section shortly describes the most urgent constraints for the study itself: the sampling method and questionnaire content. Additionally, a few words are said about the strong points and limitations that are related to the choice of using APA formatting in this paper. Following, three interesting future directions are identified. First, the mediating effect of interest in nature and prior experience via other variables perception and acceptance, secondly, whether experience needs to be personal or can be vicarious and thirdly, cross-national comparisons.

4.2.1 LIMITATIONS TO THE STUDY.

First, the sampling method – inviting people in public transport to fill out a questionnaire – may have resulted in a biased sample. Similar constraints are subject to the pilot study, where students approached people in various public areas. Although such an approach is very cheap and results in a fairly quick way of distributing and retrieval of many questionnaires, the sample that is reached is not representative for the entire Dutch population. On the other hand, within the constraints of public areas, both in case of the pilot study as well as in the main study it was strived for to find a research population that was as diverse as possible. This means that people from various ages, gender, denomination and education agreed to participate. Thus, within the limits of what was possible and available in public areas, the maximum diversity was sought after. Future research might, however, opt for a more representative sampling technique, for instance by mailed questionnaires. This could result in more diverse data and consequently could have an effect on the influence of the objective vicinity and urbanity variables on risk perception and acceptance.

A limitation to the questionnaire of the main study was that the self-reported urbanity question may not have been a valid measurement of people's actual living condition. It has been argued above that this can be solved by asking respondents for their full postal code rather than only the first to digits, in consequent studies. Moreover, the question on immediacy was possibly misunderstood by some respondents, resulting in deviating responses. Future questionnaire designs may focus on specifically these questions and try to rephrase them more clearly and understandable.

4.2.2 STRONG POINTS AND LIMITATIONS OF USING APA FORMATTING.

In writing this paper it was attempted to adhere strictly to the rules of APA style and format. A strength of using APA is a strict adherence to the formulation and investigation of Hypotheses, and thus avoidance of cherry-picking results from the available data. Use of the APA style and format therefore promotes scientific rigour and replicability of the study and stimulates the writing of short and concise papers. But this strict adherence to Hypothesis-testing also prevents the researcher from investigating other findings that emerge from the data unexpectedly, though not covered in a Hypothesis. To alleviate this omission slightly, the section ‘supplementary analyses’ was created for those findings that were not part of a specific Hypothesis, but which were nonetheless so relevant to the topic at hand that they merited being mentioned. Despite this section, however, many other interesting findings that could have been mentioned were omitted for the sake of conciseness of the paper. In Appendix D some additional analyses can be found for interested readers. Yet, if the paper would not be so strictly focused on Hypothesis testing, there might have been room available for the appendix analyses and findings to be reported in the paper itself.

This choice for APA style and format, and strict Hypothesis testing, has made the paper readable for a select audience – scientists who are familiar in the field of risk perception and acceptance – but less readable for outsiders who might be interested in the findings – such as nature managers. Such a choice is legitimate, as long as it has been made purposively, which is the argument of this paragraph; despite the drawbacks for readability for lay-people, the benefits of scientific rigour and replicability make APA the preferred style for this paper. For nature managers, a short and simplified version of the most relevant and applicable results could be written afterwards.

4.2.3 THREE POSSIBLE FUTURE RESEARCH ORIENTATIONS.

Apart from these technical and editorial issues, this paper also showed that there is still much more to be discovered about risk perception and acceptance concerning wildlife than could be covered in this study. Several things that remained unanswered in the main study beg further investigation, three of which are mentioned here.

First of all, the possible mediating role of experience with wildlife between subjective vicinity on the one hand, and risk perception and acceptance on the other hand begs for further investigation. The study indicated that experience mediated between subjective vicinity and acceptance of wild boar risks, but the exact working mechanism behind this is still unclear, as is the potential of experience to also mediate between subjective vicinity and risk perception and acceptance concerning wolf-related risks. In the main study the relationships between these constructs were too weak to give conclusive findings on such mediating connections, but further studies with clearer measures on experiences and subjective vicinity may shed more light onto the interaction between experience, vicinity and risk perception and acceptance. Moreover, the connection between experience valence and the other constructs needs to be further investigated in order to know whether influencing valence can be a good entry point for communication plans aimed at the public’s risk perceptions or acceptance. Also related to investigating the mediation of factors is the effects of the personality trait ‘interest in nature’ to risk perception and acceptance, which could have been a mediator via for instance experience or subjective vicinity. Although the results did suggest that such mediated effects could be present,

future studies should formulate clear hypotheses concerning the construct 'interest in nature', maybe even elaborate upon the construct itself and investigate further how the mediating effects work from this construct, via prior experience, vicinity to risk perception and acceptance.

It was suggested that experiences need not be experienced directly, but risks from familiar others or even 'hear-say' – vicarious experience – can be influential as well. Even TV influence and casual talks with friends may be influential to people's knowledge of wolves (Hook & Robinson, 1982) and their attitudes towards these animals (Karlsson & Sjöström, 2007). Whether this also goes for risk perceptions concerning risks with wildlife encounters remains unanswered in current scientific literature. To find out, an experimental design could be applied where particular groups experience an actual encounter with a particular species, whereas other groups are either told about an experience by a friend, or from a stranger or news article. Differences in risk perceptions after these procedures could be ascribed to the level of directness of experiences (whether they were experienced personally, by familiars or by complete strangers). Finding out whether and to what extent indirect experiences are effective in influencing people's risk perception can greatly facilitate nature managers' communication planning. It makes rather a difference whether people have to be approached and guided into an experience with wildlife individually and personally, or whether they can also learn by hearing from others' experiences.

Finally, an interesting future investigation could focus on cross-country comparisons, for instance with German citizens. In Eastern Germany, wolves are re-emerging and currently there are more than 11 packs roaming the East German country-side. Moreover, they are moving from East to West, and only recently a wolf was found – and illegally shot – in the Rhineland, very close to the Dutch-German border ("First Wolf in Rhineland", 2012) How are risk perceptions of Germans concerning these risks and how do they accept it? And how do the factors investigated in this study, vicinity and experience, influence Germans' risk perceptions and acceptance? Is the effect of experience or vicinity bigger, or smaller? Of course, a comparison with a country where residents always had to deal with dangerous wildlife species could be added to such a cross-national set-up.

5 CONCLUSION

This study showed that risk perceptions and acceptance of wildlife in the Netherlands can be partially explained by the experience people have with wildlife and the way they value these experiences, and that experience mediates between vicinity towards wildlife and risk acceptance. These insights expand current scientific understanding of risk perception and acceptance, and factors influencing these. Practically, the insights could be used by nature managers to further their communication with the Dutch public. Of particular interest to them can be the potential of values people ascribe to wildlife experiences, and their effect on risk perception and acceptance. For instance, by using either positive or negative experiences as means to reduce or increase people's risk perception concerning wildlife species, by either directly or indirectly offering such experiences. Directly, nature managers could offer nature excursions, and indirectly, they could use experiences of others to vicariously teach people either to have more or less risk perceptions and acceptance concerning particular wildlife species. The most important finding from this study is that in order to understand people's risk perceptions and acceptance concerning wildlife risks or other risks, it is very important to consider the effects of amount, impact and valence of prior experiences with the risk topic. Positively judged experiences reduce risk perception and increase acceptance of such risks, whereas high impact can potentially reduce risk perceptions. Moreover, experience can be a mediator to other variables, such as perceived closeness to wildlife habitats. In any case, people seem to infer – parts of – their risk perceptions and acceptance on their prior experiences with the risk in question. In order to communicate with the public about wildlife related risks and influence their risk perceptions and acceptance, therefore, nature managers could use people's experiences with such wildlife as an entry point and tailor their communication to consider these experiences and its influence.

6 REFERENCES

- Baldassare, M., & Katz, C. (1992). The personal threat of environmental problems as predictor of environmental practices. *Environment and Behavior*, 24(5), 602–616. doi:10.1177/0013916592245002
- Barnett, J., & Breakwell, G. M. (2001). Risk perception and experience: Hazard personality profiles and individual differences. *Risk Analysis*, 21(1), 171–178. doi:10.1111/0272-4332.211099
- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51, 1173–1182.
- Beekmans, K. (2012, August 2). De opmars van de wolf: Op de Veluwe kun je best vijf roedels kwijt. *De Groene Amsterdammer*, 20–22.
- Bjerke, T., Reitan, O., & Kellert, S. R. (1998). Attitudes toward wolves in southeastern Norway. *Society & Natural Resources*, 11(2), 169–178. doi:10.1080/08941929809381070
- Boitani, L. (2003). *Wolves: behavior, ecology, and conservation*. Chicago: University of Chicago Press.
- Boitani, L., Fritts, S., Stephenson, R., & Hayes, R. (2003). Wolves and Humans. In L. Boitani & D. Mech (Eds.), *Wolves: Behavior, ecology, and conservation* (289–316). Chicago: University of Chicago Press.
- Bonninger, D.S., Krosnick, J.A., Berent, M.K., (1995). Origins of attitude importance: self-interest, social identification and value relevance. *Journal of Personality Social Psychology* 68, 61–80.
- Brewer, N. T., Chapman, G. B., Gibbons, F. X., Gerrard, M., McCaul, K. D., & Weinstein, N. D. (2007). Meta-analysis of the relationship between risk perception and health behavior: The example of vaccination. *Health Psychology*, 26(2), 136–145. doi:10.1037/0278-6133.26.2.136
- CBS (2012, May). Various statistics, CBS Statline. Retrieved May 2012, from www.statline.nl
- Decker, D. J., Lauber, T. B., & Siemer, W. F. (2002). *Human-wildlife conflict management: a practitioner's guide (Manual)*. New York: Cornell University Press.
- Ericsson, G., & Heberlein, T. A. (2003). Attitudes of hunters, locals, and the general public in Sweden now that the wolves are back. *Biological Conservation*, 111(2), 149–159. doi:10.1016/S0006-3207(02)00258-6
- Everzwijnen in Hartje Hamburg, 2012, May 23rd, Nu.nl, Algemeen- Buitenland, retrieved from <http://www.nu.nl/buitenland/2817720/everzwijnen-in-hartje-hamburg.html> (retrieved on 28/05/12)
- Field, A. (2005). *Discovering Statistics using SPSS (3rd ed.)*. London, SAGE publications Ltd.
- Finucane, M. L., Slovic, P., Mertz, C. K., Flynn, J., & Satterfield, T. A. (2000). Gender, race, and perceived risk: The “white male” effect. *Health, Risk & Society*, 2(2), 159–172.
- First Wolf in Rhineland for 120 years shot dead, 2012, April, 23rd, The Local, retrieved from <http://www.thelocal.de/national/20120423-42117.html> (retrieved on 31/5/12)
- Fischhoff, B., Lichtenstein, S., Slovic, P., Derby, S. L., & Keeney, R. (1984). *Acceptable Risk*. (2nd ed.) Cambridge, UK: Cambridge University Press.
- Fischhoff, B. (1994). Acceptable risk: A conceptual proposal. *Risk: Health, Safety & Environment*, 5, 1-18. Retrieved from: <http://sds.hss.cmu.edu/media/pdfs/fischhoff/AcceptableRiskConceptProp.pdf>
- 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(2), 127–152. doi:10.1007/BF00143739
- Gliem, J.A., Gliem, R.R., (2003). Calculating, interpreting, and reporting Cronbach's Alpha reliability coefficient for Likert-type scales. *Midwest Research to Practice Conference in Adult, Continuing, and Community Education*, 82–88.
- Gore, M. L., Knuth, B. A., Curtis, P. D., & Shanahan, J. E. (2006). Stakeholder perceptions of risk associated with human–black bear conflicts in New York's Adirondack park campgrounds: Implications for theory and practice. *Wildlife Society Bulletin*, 34(1), 36–43. doi:10.2193/0091-7648(2006)34[36:SPORAW]2.0.CO;2

- Gore, M. L., Knuth, B. A., Curtis, P. D., & Shanahan, J. E. (2007a). Campground manager and user perceptions of risk associated with negative human–black bear interactions. *Human Dimensions of Wildlife*, 12(1), 31–43. doi:10.1080/10871200601107882
- Gore, M. L., Knuth, B. A., Curtis, P. D., & Shanahan, J. E. (2007b). Factors influencing risk perception associated with human–black bear conflict. *Human Dimensions of Wildlife*, 12(2), 133–136. doi:10.1080/10871200701195985
- Gore, M. L., Wilson, R. S., Siemer, W. F., Wieczorek Hudenko, H., Clarke, C. E., Sol Hart, P., Maguire, L. A., et al. (2009). Application of risk concepts to wildlife management: Special issue introduction. *Human Dimensions of Wildlife*, 14(5), 301–313. doi:10.1080/10871200903160944
- Groot Bruinderink, G., & Dekker, J. (2010). *Wilde Zwijnen* (1st ed.). Zeist: KNNV Uitgeverij ism. Zoogdiervereniging. Retrieved from <http://www.knnvuitgeverij.nl/NL/webwinkel/0/wilde%20zwijn/7424> (14/5/12)
- Groot Bruinderink, G. W. T. A. (2008). Toepasbaarheid in Nederland van afweer- en lokmiddelen voor wilde zwijnen (*Sus scrofa scrofa L.*) (Alterra Rapport No. 1739). Wageningen: Alterra - WUR. Retrieved from <http://content.alterra.wur.nl/Webdocs/PDFFiles/Alterrarrapporten/AlterraRapport1739.pdf>
- Groot Bruinderink, G. W. T. A., Lammertsma, D. R., Jagers op Akkerhuis, G. A. J. M., Ozinga, W., Stumpel, A. H. P., & de Waal, R. W. (2010). *Ex ante evaluatie van maatwerk beheer van wilde zwijnen* (Alterra Rapport No. 1944) . Wageningen: Alterra - WUR. Retrieved from <http://content.alterra.wur.nl/Webdocs/PDFFiles/Alterrarrapporten/AlterraRapport1944.pdf>
- Groot Bruinderink, G. W. T. A., Lammertsma, D. R., Pouwels, R., van Eupen, M., Spek, G. J., & Oord, J. G. (2011). *Wilde zwijnen in Limburg. Wat zijn de consequenties van meer leefgebieden voor Wilde zwijnen in Limburg?* (Alterra Rapport No. 2207). Wageningen: Alterra - WUR. Retrieved from <http://content.alterra.wur.nl/Webdocs/PDFFiles/Alterrarrapporten/AlterraRapport2207.pdf>
- Heberlein, T. A., & Ericsson, G. (2005). Ties to the Countryside: Accounting for urbanites attitudes toward hunting, wolves, and wildlife. *Human Dimensions of Wildlife*, 10 (3), 213–227. doi:10.1080/10871200591003454
- Hook, R.A., Robinson, W.L., (1982). Attitudes of Michigan citizens toward predators. In: Harrington, F.H., Paquet, P.C. (Eds.), *Wolves of the World*. Noyes publications, Park Ridge, New Jersey.
- Huizenga, N., Mölling, P., & Hoof, P. H. van. (2010). *Zoogdieren van Limburg: verspreiding en ecologie in de periode 1980-2007*. Natuurhistorisch Genootschap in Limburg.
- Johansson, M., & Karlsson, J. (2011). Subjective experience of fear and the cognitive interpretation of large carnivores. *Human Dimensions of Wildlife*, 16(1), 15–29. doi:10.1080/10871209.2011.535240
- Johansson, M., Karlsson, J., Pedersen, E., & Flykt, A. (2012). Factors governing human fear of brown bear and wolf. *Human Dimensions of Wildlife*, 17(1), 58–74. doi:10.1080/10871209.2012.619001
- Kallmen, H. (2000). Manifest anxiety, general self-efficacy and locus of control as determinants of personal and general risk perception. *Journal of Risk Research*, 3 (2), 111–120. doi:10.1080/136698700376626
- Karlsson, J., & Sjöström, M. (2007). Human attitudes towards wolves, a matter of distance. *Biological Conservation*, 137(4), 610–616. doi:10.1016/j.biocon.2007.03.023
- Kasperson, J. X., Kasperson, R. E., Pidgeon, N., & Slovic, P. (2003). The social amplification of risk: Assessing fifteen years of research and theory. In N. Pidgeon, R. Kasperson, & P. Slovic (Eds.), *The social amplification of risk* (pp 13-46). London: Cambridge University Press.
- Kellens, W., Zaalberg, R., Neutens, T., Vanneuville, W., & De Maeyer, P. (2011). An analysis of the public perception of flood risk on the Belgian coast. *Risk Analysis: An Official Publication of the Society for Risk Analysis*, 31(7), 1055–1068. doi:10.1111/j.1539-6924.2010.01571.x
- Kleiven, J., Bjerke, T., & Kaltenborn, B. P. (2004). Factors influencing the social acceptability of large carnivore behaviours. *Biodiversity and Conservation*, 13 (9), 1647–1658. doi:10.1023/B:BIOC.0000029328.81255.38
- Manipady, S., Menezes, R.G., Bastia, B.K., (2005). Death by attack from a wild boar. *Journal of Clinical Forensic Medicine*, 13 (2), 89-91

- Martin, W. E., Martin, I. M., & Kent, B. (2009). The role of risk perceptions in the risk mitigation process: the case of wildfire in high risk communities. *Journal of Environmental Management*, *91*(2), 489–498. doi:10.1016/j.jenvman.2009.09.007
- O'Connor, R. E., Bard, R. J., & Fisher, A. (1999). Risk perceptions, general environmental beliefs, and willingness to address climate change. *Risk Analysis*, *19* (3), 461–471. doi:10.1111/j.1539-6924.1999.tb00421.x
- Pennings, D., (2012, May 9). Wilde zwijnen doden? *Eindhovens Dagblad, Opinion*, retrieved from: <http://www.ed.nl/mening/11005984/Wilde-zwijnen-doden%3F.ece> (14/5/12)
- Schley, L., Dufrêne, M., Krier, A., & Frantz, A. C. (2008). Patterns of crop damage by wild boar (*Sus scrofa*) in Luxembourg over a 10-year period. *European Journal of Wildlife Research*, *54* (4), 589–599. doi:10.1007/s10344-008-0183-x
- Sjöberg. (2000a). Factors in risk perception. *Risk Analysis: An Official Publication of the Society for Risk Analysis*, *20* (1), 1–11.
- Sjöberg, L. (2000b). Perceived risk and tampering with nature. *Journal of Risk Research*, *3*(4), 353–367. doi:10.1080/13669870050132568
- Sjöberg, L., & Wählberg, A. (2002). Risk perception and new age beliefs. *Risk Analysis*, *22* (4), 751–764. doi:10.1111/0272-4332.00066
- Slimak, M. W., & Dietz, T. (2006). Personal values, beliefs, and ecological risk perception. *Risk Analysis*, *26* (6), 1689–1705. doi:10.1111/j.1539-6924.2006.00832.x
- Slovic, P. (1987). Perception of risk. *Science*, *236*(4799), 280–285. doi:10.1126/science.3563507
- Slovic, P. (1999). Trust, emotion, sex, politics, and science: Surveying the risk-assessment battlefield. *Risk Analysis*, *19* (4), 689–701. doi:10.1111/j.1539-6924.1999.tb00439.x
- Teigen, K. H. (2005). The proximity heuristic in judgments of accident probabilities. *British Journal of Psychology*, *96* (4), 423–440. doi:10.1348/000712605X47431
- Thornton, C., & Quinn, M. S. (2010). Risk perceptions and attitudes toward cougars in the southern foothills of Alberta. *Human Dimensions of Wildlife*, *15* (5), 359–372. doi:10.1080/10871200903582626
- Trimpop, R. (1994). How do we perceive risks? In R. Trimpop (Eds.) *The psychology of risk taking behavior* (15–26). Amsterdam, Elsevier.
- Trouwborst, A. (2010). Managing the carnivore comeback: International and EU species protection law and the return of lynx, wolf and bear to Western Europe. *Journal of Environmental Law*, *22* (3), 347–372.
- Williams, C. K., Ericsson, G., & Heberlein, T. A. (2002). A quantitative summary of attitudes toward wolves and their reintroduction (1972-2000). *Wildlife Society bulletin*, *30* (2), 575–584.
- Willis, H. H., & DeKay, M. L. (2007). The roles of group membership, beliefs, and norms in ecological risk perception. *Risk Analysis*, *27*(5), 1365–1380. doi:10.1111/j.1539-6924.2007.00958.x
- Willis, H. H., DeKay, M. L., Fischhoff, B., & Morgan, M. G. (2005). Aggregate, disaggregate, and hybrid analyses of ecological risk perceptions. *Risk Analysis: An Official Publication of the Society for Risk Analysis*, *25* (2), 405–428. doi:10.1111/j.1539-6924.2005.00599.x
- Wolven rukken op. (2012, January 18). *De Telegraaf*, p. 9. Amsterdam.
- Zinn, H. C., & Pierce, C. L. (2002). Values, gender, and concern about potentially dangerous wildlife. *Environment and Behavior*, *34* (2), 239–256. doi:10.1177/0013916502034002005

7 APPENDIX

7.1 APPENDIX A: QUESTIONNAIRE

VRAGENLIJST

Aan de Universiteit van Wageningen wordt een onderzoek gedaan naar de natuurbeleving van Nederlanders. Daarom wil ik u graag verzoeken de volgende vragenlijst in te vullen. Deelname duurt 10 tot 15 minuten en onder deelnemers worden 10 boekenbonnen ter waarde van 5 Euro verloot.

Het onderzoek is uitsluitend voor academische doeleinden bedoeld, en er zijn geen commerciële bedrijven bij betrokken. De gegevens die u verstrekt worden derhalve enkel gebruikt voor een wetenschappelijke rapportage. Alle gegevens zullen daarbij anoniem behandeld worden.

Indien u nu of tijdens het invullen verdere vragen heeft, kunt u mij deze altijd stellen.

Door middel van het tekenen van deze verklaring geeft u aan voldoende geïnformeerd te zijn over dit onderzoek en geeft u toestemming voor het anoniem gebruik van de gegevens uit deze vragenlijst.

Datum:

Plaats:

Handtekening:

INTRODUCTIE

In sommige plekken in Nederland lopen er in de natuur grote wilde dieren rond. Hierbij kunt u denken aan bijvoorbeeld reeën, herten, Heckrunderen en Konikpaarden, maar ook bijvoorbeeld wilde zwijnen. Daarnaast is er een kans dat in de toekomst wolven en lynxen in Nederlandse natuurgebieden zullen rondlopen.

Ik ben geïnteresseerd in de natuurbeleving van Nederlanders en één aspect daarvan is de beleving van bepaalde diersoorten. Deze vragenlijst concentreert zich op **twee diersoorten**, het wilde zwijn en de wolf. Hieronder volgt een korte beschrijving per diersoort.

Het **wilde zwijn** leeft in veel natuurgebieden in Nederland, bijvoorbeeld op de Veluwe, maar óók buiten grote (beschermde) natuurgebieden. Er zijn berichten van wilde zwijnen die bebouwde gebieden binnentreden, op zoek naar voedsel. Boeren zijn vaak tegenstander van de terugkeer van wilde zwijnen, vanwege de schade aan akkers. Andere mensen vinden het juist een goede ontwikkeling want deze dieren geven aan dat het de goede kant op gaat met de Nederlandse natuur. Niet iedereen weet dat wilde zwijnen gevaarlijk kunnen zijn voor mensen, als ze zich in het nauw gedreven of bedreigd voelen. Een aanvallend wild zwijn kan veel letsel veroorzaken. Overigens vallen ze bijna nooit aan. Ze zijn van nature mensenschuw. Die schuwheid zou kunnen afnemen als ze vaak positief contact met mensen hebben, bijvoorbeeld door bijvoeren.

Wolven zijn nog niet ‘officieel’ woonachtig in Nederland, maar in het oosten van Nederland zijn al herhaalde mogelijke wolf-waarnemingen gedaan. Die wolven kunnen vanuit Duitsland de grens zijn overgestoken. Daar neemt het aantal roedels gestaag toe, momenteel zijn er wel 11 wolvenroedels. Wolven zijn van nature trekkers die grote afstanden afleggen in korte perioden. Het is goed mogelijk dat in de toekomst een wolvenpak zich vestigt in Nederland, bijvoorbeeld op de Veluwe. Aan voedsel, zoals reeën, herten en wilde zwijnen, geen gebrek! Net als wilde zwijnen zijn wolven moeilijk in te perken tot enkel beschermde natuurgebieden. Op zoek naar eten kunnen ze dorpen en zelfs voorsteden binnensluipen. Ook wolven zijn van nature mensenschuw en zullen vaak alleen in de schemer of nacht in de buurt van steden komen. Confrontaties tussen mensen en wolven zijn daarom tot nu toe nog zeldzame gebeurtenissen.

In deze vragenlijst zullen een aantal ‘**scenario’s**’ worden beschreven, waarin een bepaalde risicovolle gebeurtenis geschetst wordt. Deze scenario’s worden gevolgd door vragen. Ik wil u verzoeken om u het beschreven scenario zo goed mogelijk voor te stellen, ‘*alsof het werkelijk gebeurt*’, en vervolgens de vragen te beantwoorden vanuit dat perspectief.

Hieronder volgt een **voorbeeld** van twee vragen, die direct volgen op een scenario. De bedoeling is dat u het bolletje aanvinkt of inkleurt dat het meest bij uw mening past. De vragen geven een schaal tussen twee extreme standpunten, maar u kunt natuurlijk ook ergens ‘in het midden’ zitten. Stel u heeft het scenario gelezen en vindt de situatie extreem onveilig, bovendien best wel riskant (sommige mensen zien hier een nuance-verschil tussen). U vindt dat het risico niet echt acceptabel is en vindt het absoluut onaanvaardbaar. U kunt dan het volgende invullen:

Voorbeeld 1: Zou u het risico in deze situatie inschatten als...

Extreem veilig	<input type="radio"/>	<input checked="" type="radio"/>	Extreem onveilig					
Totaal niet riskant	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	Erg riskant				

Voorbeeld 2: Vindt u het risico in deze situatie

Compleet acceptabel	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	Compleet onacceptabel				
Absoluut aanvaardbaar	<input type="radio"/>	<input checked="" type="radio"/>	Absoluut onaanvaardbaar					

VRAGEN

Scenario 1: De achtertuinervaring

Stel u voor dat u door uw eigen tuin of het park in de buurt wandelt. Plotseling hoort u geritsel in een struikje. U loopt richting het geluid, en ineens staat u oog in oog met een wolf. U verstrakt (wat moet u doen?), en de wolf staart u aan, terwijl hij stokstijf stil blijft staan, net als uzelf.

1. Zou u het risico in deze situatie inschatten als...

Extreem veilig	<input type="radio"/>	Extreem onveilig						
Totaal niet riskant	<input type="radio"/>	Erg riskant						

2. Vindt u het risico in deze situatie ...

Compleet acceptabel	<input type="radio"/>	Compleet onacceptabel						
Absoluut aanvaardbaar	<input type="radio"/>	Absoluut onaanvaardbaar						

Scenario 2: De botsing

Stel u voor dat u met uw auto over een landweg rijdt. Het schemert en uw koplampen zijn al aan. Opeens ziet u iets schitteren aan de zijkant van de weg. Instinctief rijdt u iets langzamer; misschien hoopt u wel om een ree of edelhert te kunnen zien. Plotseling springt er een grijze schaduw vlak vóór uw auto, u hoort een knal en stopt onmiddellijk. U wilt uit uw auto stappen om te zien wat u geraakt heeft, maar bedenkt op het laatste moment dat de grijze schim verdacht veel op een wolf leek. In de schemer meent u glinsterende tanden te hebben gezien. Maar dat zou natuurlijk ook uw verbeelding kunnen zijn. U zou graag uit willen stappen en nader inspecteren, maar de gedachte aan een wolf houdt u tegen of brengt u aan het twijfelen...

3. Zou u het risico in deze situatie inschatten als...

Extreem veilig	<input type="radio"/>	Extreem onveilig						
Totaal niet riskant	<input type="radio"/>	Erg riskant						

4. Vindt u het risico in deze situatie ...

Compleet acceptabel	<input type="radio"/>	Compleet onacceptabel						
Absoluut aanvaardbaar	<input type="radio"/>	Absoluut onaanvaardbaar						

Scenario 3: Ervaring tijdens het wandelen

Stel u voor dat u op een mooie dag door een nabijgelegen natuurgebied wandelt, of fietst. U geniet van de natuur, de geluiden en de geuren, als u plotseling beweging van een groot iets waarneemt vanuit uw ooghoeken. U remt af en staat stil, en tuurt door de bosjes wat het kan zijn geweest. Plotseling realiseert u zich dat u oog in oog staat met een wolf. U verstrakt (wat moet u doen?), en de wolf staart u aan, terwijl hij stokstijf stil blijft staan, net als uzelf.

5. Zou u het risico in deze situatie inschatten als...

Extreem veilig	<input type="radio"/>	Extreem onveilig						
Totaal niet riskant	<input type="radio"/>	Erg riskant						

6. Vindt u het risico in deze situatie ...

Compleet acceptabel	<input type="radio"/>	Compleet onacceptabel						
Absoluut aanvaardbaar	<input type="radio"/>	Absoluut onaanvaardbaar						

De kans die men loopt op ontmoetingen met wilde dieren, zoals in de scenario's, noemt men ook wel een 'risico'. De volgende vragen gaan over dit risico van een 'mogelijke ontmoeting met de wolf'.

7. Heeft u het gevoel dat u vrijwillig aan dit risico wordt blootgesteld?
-
- | | | | | | | | | |
|-------------------|---|---|---|---|---|---|---|---------------------|
| Geheel vrijwillig | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Geheel onvrijwillig |
|-------------------|---|---|---|---|---|---|---|---------------------|
-
8. Heeft u het gevoel dat u zeer direct de gevolgen van het risico zult ervaren?
-
- | | | | | | | | | |
|-------------|---|---|---|---|---|---|---|------------|
| Zeer direct | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Veel later |
|-------------|---|---|---|---|---|---|---|------------|
-
9. Denkt u dat u zelf genoeg weet over het risico dat u loopt?
-
- | | | | | | | | | |
|-----------------|---|---|---|---|---|---|---|---------------------------|
| Weet ik precies | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Weet ik (bijna) niets van |
|-----------------|---|---|---|---|---|---|---|---------------------------|
-
10. Denkt u dat de wetenschap genoeg weet over het risico dat gelopen wordt door mensen?
-
- | | | | | | | | | |
|------------------------|---|---|---|---|---|---|---|--------------------------------|
| Wetenschap weet genoeg | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Wetenschap weet veel te weinig |
|------------------------|---|---|---|---|---|---|---|--------------------------------|
-
11. Heeft u het gevoel dat u veel controle heeft over hoeveel risico u loopt?
-
- | | | | | | | | | |
|---------------|---|---|---|---|---|---|---|-----------------|
| Veel controle | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Weinig controle |
|---------------|---|---|---|---|---|---|---|-----------------|
-
12. Is dit risico nieuw voor u of is het iets waar u al langer aan blootgesteld voelt?
-
- | | | | | | | | | |
|----------------|---|---|---|---|---|---|---|-------------------|
| Compleet nieuw | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Totaal niet nieuw |
|----------------|---|---|---|---|---|---|---|-------------------|
-
13. Is het risico iets dat slechts enkele mensen kan schaden, of het iets dat grootschalige schade kan aanrichten aan veel mensen tegelijkertijd?
-
- | | | | | | | | | |
|---------------|---|---|---|---|---|---|---|--------------------|
| Enkele mensen | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Grote groep mensen |
|---------------|---|---|---|---|---|---|---|--------------------|
-
14. Wanneer u aan dit risico denkt, kunt u er dan redelijk kalm onder blijven, of voelt u grote angst in u opkomen?
-
- | | | | | | | | | |
|---------------------|---|---|---|---|---|---|---|----------------------|
| Kalm over te denken | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Paniek/angst komt op |
|---------------------|---|---|---|---|---|---|---|----------------------|
-
15. Hoe fataal denkt u dat de gevolgen kunnen zijn van dit risico?
-
- | | | | | | | | | |
|-------------------|---|---|---|---|---|---|---|------------------|
| Zeker niet fataal | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Zeker wel fataal |
|-------------------|---|---|---|---|---|---|---|------------------|
-
16. Heeft u het idee dat u dichterbij een gebied woont waar in de toekomst wolven zouden kunnen rondlopen, in vergelijking met de gemiddelde Nederlander?
-
- | | | | | | | | | |
|-----------------|---|---|---|---|---|---|---|-----------------|
| Veel dichterbij | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Veel verder weg |
|-----------------|---|---|---|---|---|---|---|-----------------|
-

Op de volgende pagina worden *dezelfde scenario's* die u eerder heeft gelezen herhaald, maar ditmaal gaan de vragen over een ontmoeting met het wilde zwijn.

Scenario 4: De achtertuinervaring deel II

Stel u voor dat u door uw eigen tuin of het park in de buurt wandelt. Plotseling hoort u geritsel in een struikje. U loopt richting het geluid, en ineens staat u oog in oog met een wild zwijn. U verstrakt (wat moet u doen?), en het wilde zwijn staart u aan, terwijl hij stokstijf stil blijft staan, net als uzelf.

17. Zou u het risico in deze situatie inschatten als...

Extreem veilig	<input type="radio"/>	Extreem onveilig						
Totaal niet riskant	<input type="radio"/>	Erg riskant						

18. Vindt u het risico in deze situatie ...

Compleet acceptabel	<input type="radio"/>	Compleet onacceptabel						
Absoluut aanvaardbaar	<input type="radio"/>	Absoluut onaanvaardbaar						

Scenario 5: De botsing, deel II

Stel u voor dat u met uw auto over een landweg rijdt. Het schemert en uw koplampen zijn al aan. Opeens ziet u iets schitteren aan de zijkant van de weg. Instinctief rijdt u iets langzamer; misschien hoopt u wel om een ree of edelhert te kunnen zien. Plotseling springt er een grijze schaduw vlak vóór uw auto, u hoort een knal en stopt onmiddellijk. U wilt uit uw auto stappen om te zien wat u geraakt heeft, maar bedenkt op het laatste moment dat de grijze schim verdacht veel op een wild zwijn leek. In de schemer meent u glinsterende hoektanden te hebben gezien. Maar dat zou natuurlijk ook uw verbeelding kunnen zijn. U zou graag uit willen stappen en nader inspecteren wat het was dat uw auto raakte, maar de gedachte aan een wild zwijn houdt u tegen of brengt u aan het twifelen...

19. Zou u het risico in deze situatie inschatten als...

Extreem veilig	<input type="radio"/>	Extreem onveilig						
Totaal niet riskant	<input type="radio"/>	Erg riskant						

20. Vindt u het risico in deze situatie ...

Compleet acceptabel	<input type="radio"/>	Compleet onacceptabel						
Absoluut aanvaardbaar	<input type="radio"/>	Absoluut onaanvaardbaar						

Scenario 6: Ervaring tijdens het wandelen, deel II

Stel u voor dat u op een mooie dag door een nabijgelegen natuurgebied wandelt, of fietst. U geniet van de natuur, de geluiden en de geuren, als u plotseling beweging van een groot iets waarneemt vanuit uw ooghoeken. U remt af en staat stil, en tuurt door de bosjes wat het kan zijn geweest. Plotseling realiseert u zich dat u oog in oog staat met een wild zwijn. U verstrakt (wat moet u doen?), en het wilde zwijn staart u aan, terwijl hij stokstijf stil blijft staan, net als uzelf.

21. Zou u het risico in deze situatie inschatten als...

Extreem veilig	<input type="radio"/>	Extreem onveilig						
Totaal niet riskant	<input type="radio"/>	Erg riskant						

22. Vindt u het risico in deze situatie ...

Compleet acceptabel	<input type="radio"/>	Compleet onacceptabel						
Absoluut aanvaardbaar	<input type="radio"/>	Absoluut onaanvaardbaar						

De kans die men loopt op ontmoetingen met wilde dieren, zoals in de scenario's, noemt men ook wel een 'risico'. De volgende vragen gaan over dit risico van een 'mogelijke ontmoeting met het wilde zwijn'.

23. Heeft u het gevoel dat u vrijwillig aan dit risico wordt blootgesteld?

Geheel vrijwillig	<input type="radio"/>	Geheel onvrijwillig						
-------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	---------------------

24. Heeft u het gevoel dat u zeer directe de gevolgen van het risico zult ervaren?

Zeer direct	<input type="radio"/>	Veel later						
-------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	------------

25. Denkt u dat u zelf genoeg weet over het risico dat u loopt?

Weet ik precies	<input type="radio"/>	Weet ik (bijna) niets van						
-----------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	---------------------------

26. Denkt u dat de wetenschap genoeg weet over het risico dat gelopen wordt door mensen?

Wetenschap weet genoeg	<input type="radio"/>	Wetenschap weet veel te weinig						
------------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	--------------------------------

27. Heeft u het gevoel dat u veel controle heeft over hoeveel risico u loopt?

Veel controle	<input type="radio"/>	Weinig controle						
---------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------

28. Is dit risico nieuw voor u of is het iets waar u al langer aan blootgesteld voelt?

Compleet nieuw	<input type="radio"/>	Totaal niet nieuw						
----------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-------------------

29. Is het risico iets dat slechts enkele mensen kan schaden, of het iets dat grootschalige schade kan aanrichten aan veel mensen tegelijkertijd?

Enkele mensen	<input type="radio"/>	Grote groep mensen						
---------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	--------------------

30. Wanneer u aan dit risico denkt, kunt u er dan redelijk kalm onder blijven, of voelt u grote angst in u opkomen?

Kalm over te denken	<input type="radio"/>	Paniek/angst komt op						
---------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	----------------------

31. Hoe fataal denkt u dat de gevolgen kunnen zijn van dit risico?

Zeker niet fataal	<input type="radio"/>	Zeker wel fataal						
-------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	------------------

32. Heeft u het idee dat u dichterbij een gebied woont waar wilde zwijnen zouden kunnen rondlopen, in vergelijking met de gemiddelde Nederlander?

Veel dichterbij	<input type="radio"/>	Veel verder weg						
-----------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------

Ervaringen

33. Deze vraag gaat over of u of iemand in uw naaste omgeving of familie, ervaring heeft in het verleden, met grote dieren in het wild in Nederland, en welke indruk deze ervaring heeft gehad, en of die indruk negatief dan wel positief was. Het gaat hier niet om specifiek wolven, maar om grote wilde dieren in het algemeen.

Geen ervaring met groot wild	<input type="radio"/>	Veel ervaring met groot wild						
Ervaring heeft <u>weinig indruk</u> gemaakt	<input type="radio"/>	Ervaring heeft <u>veel indruk</u> gemaakt						
Ervaring was <u>zeer negatief</u>	<input type="radio"/>	Ervaring was <u>zeer positief</u>						

34. Hoe is uw interesse in wilde dieren en natuur?

Ik ben <u>helemaal niet geïnteresseerd</u> in wilde diersoorten	<input type="radio"/>	Ik ben <u>heel erg geïnteresseerd</u> in wilde diersoorten						
Ik ga <u>helemaal niet graag</u> naar natuurgebieden om wilde dieren te zien	<input type="radio"/>	Ik ga <u>erg graag</u> naar natuurgebieden om wilde dieren te zien						
Ik bezoek <u>zelden</u> natuurgebieden	<input type="radio"/>	Ik bezoek <u>vaak</u> natuurgebieden						

Tot slot nog een paar korte vragen over uzelf.

35. Geslacht:

Man	<input type="radio"/>
Vrouw	<input type="radio"/>

36. Leeftijd: _____ jaar

37. Woonachtig in:

Landelijk gebied	<input type="radio"/>
Stedelijk gebied	<input type="radio"/>

38. Eerste twee nummers van uw postcode: __ __

39. Hoogst voltooide opleiding:

- Geen opleiding/lager onderwijs
- Lager beroepsonderwijs/middelbaar voortgezet onderwijs (LBO, VMBO, MAVO)
- Middelbaar beroepsonderwijs/hoger voortgezet onderwijs (MBO, HAVO, VWO)
- Hoger beroepsonderwijs/wetenschappelijk onderwijs (GBO, universiteit)

40. Geloof:

- Katholiek
- Protestant
- Moslim
- Spiritueel/anderszins
- Niet gelovig

Als u wilt **kansmaken op één van de 10 boekenbonnen**, zou u dan uw email-adres hieronder op de stippellijn willen noteren?

Emailadres:.....

Hartelijk bedankt voor het beantwoorden van deze vragenlijst.

7.2 APPENDIX B: MAP OF OBJECTIVE VICINITY DISTINCTION

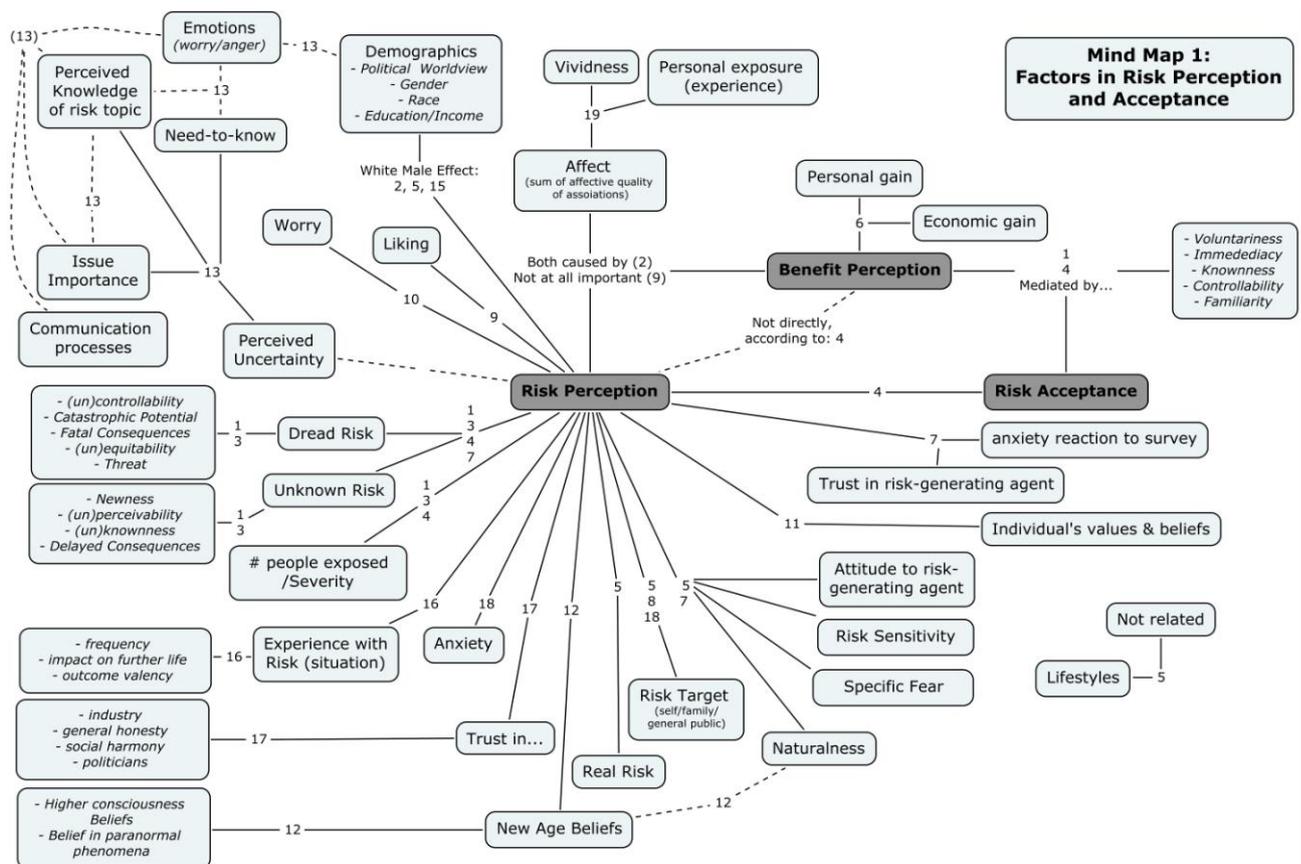


7.3 APPENDIX C: RESULTS OF LITERATURE STUDY IN MIND MAPS

Note to Mind Maps: The below Mind Maps were created as a result of an extensive literature study preceding the questionnaire studies reported in the above paper. These Mind Maps served as assisting visualisations for the author in order to clarify the many factors influencing risk perceptions, and attitudes towards wildlife. They were not meant as material to present in an article, but for the purpose of showing the depth and vigour of this thesis, they have been appended here. They therefore serve as an illustration of the multitude of factors that were investigated in the literature-study.

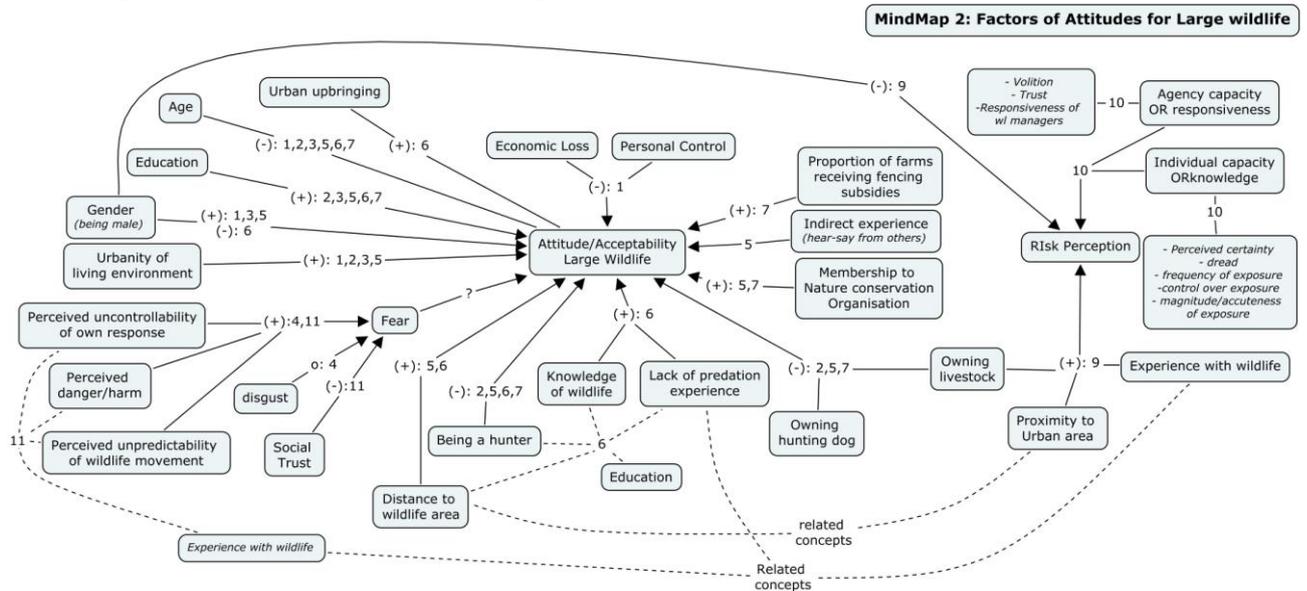
In Mind Map 1 and 3 the numbers represent studies – mentioned in the Tables below the Mind Maps – that measured and reported the relationship between the two mentioned items. For Mind Map 2, moreover, the (+) and (-) respectively show whether such relationships were found to be positive or negative.

Mind Map 1: Factors in Risk Perception and Acceptance



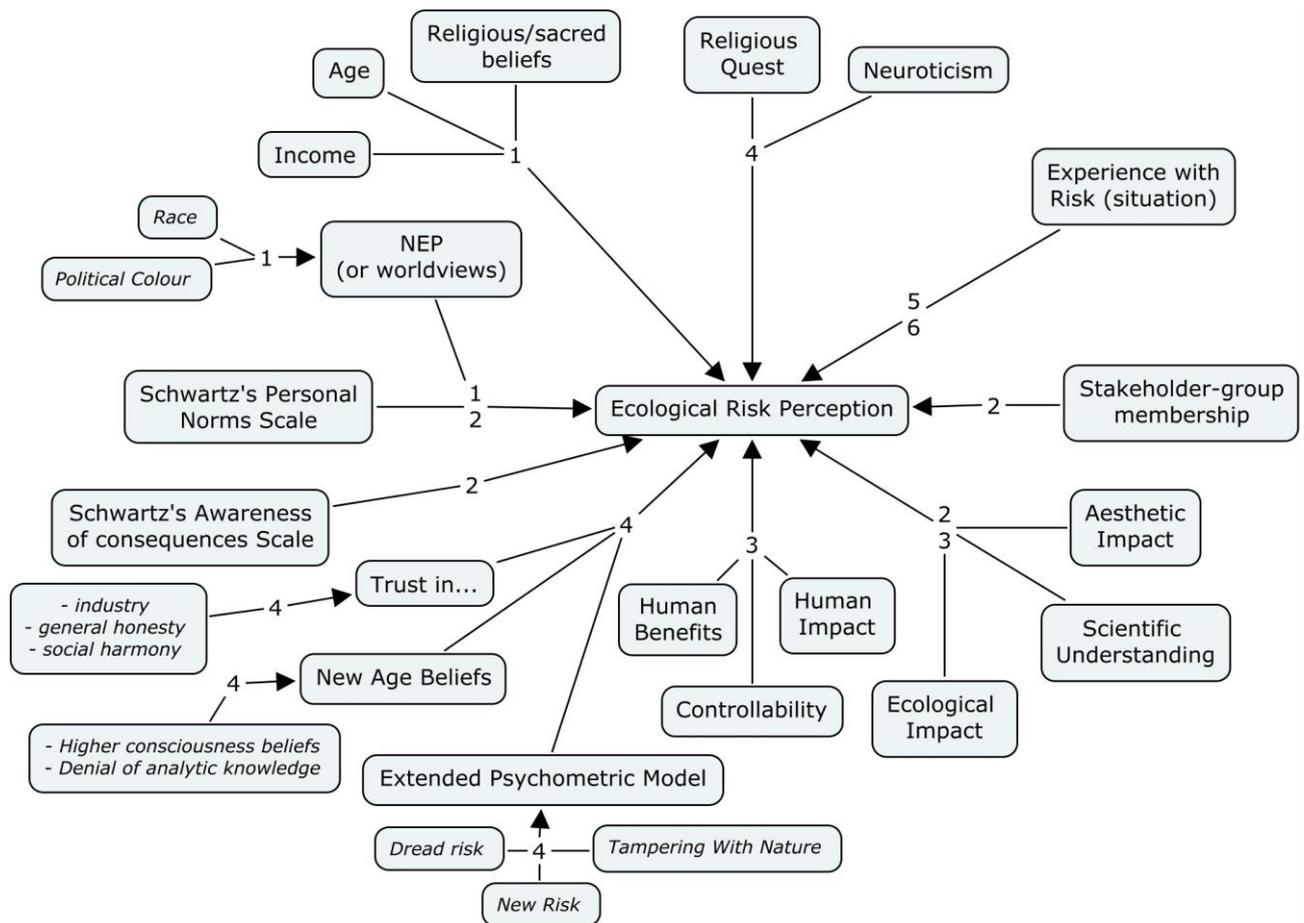
- 1 Gutteling, J. Wiegman, O.,(1996). Chapter 4: The Risk Communication Audience. In: Gutteling J., Wiegman, O.,Exploring Risk Communication, Dordrecht: Kluwer Academic Publishers (pp. 99-119)
- 2 Slovic, P. (1999). Trust, emotion, sex, politics, and science: Surveying the risk-assessment battlefield. *Risk Analysis*, 19 (4), 689–701. doi:10.1111/j.1539-6924.1999.tb00439.x
- 3 Slovic, P. (1987). Perception of risk. *Science*, 236(4799), 280 –285. doi:10.1126/science.3563507
- 4 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(2), 127–152. doi:10.1007/BF00143739
- 5 Sjöberg. (2000a). Factors in risk perception. *Risk Analysis: An Official Publication of the Society for Risk Analysis*, 20 (1), 1–11.
- 6 Gregory, R., Mendelsohn, R., (1993). Perceived Risk, Dread and Benefits, *Risk Analysis*, 13(3), 259-264
- 7 Sjöberg, L. (2000b). Perceived risk and tampering with nature. *Journal of Risk Research*, 3(4), 353–367. doi:10.1080/13669870050132568
- 8 Sjöberg, L. (2003). The different dynamics of personal and general risk, *Risk Management: An International Journal* 5, 19–34
- 9 Sjöberg, L., (2006). Will the real meaning of affect please stand up? *Risk research*, 9(2), 101-108
- 10 Rundmo, T., (2002). Associations between affect and risk perception, *Journal of Risk research*, 5(2), 119-135
- 11 Slimak, M. W., & Dietz, T. (2006). Personal values, beliefs, and ecological risk perception. *Risk Analysis*, 26 (6), 1689–1705. doi:10.1111/j.1539-6924.2006.00832.x (see also MM3 # 1)

Mind Map 2: Factors of Attitudes on Large Wildlife



- Kleiven, J., Bjerke, T., & Kaltenborn, B. P. (2004). Factors influencing the social acceptability of large carnivore behaviours. *Biodiversity and Conservation*, 13 (9), 1647–1658. doi:10.1023/B:BIOC.0000029328.81255.38
- Williams, C. K., Ericsson, G., & Heberlein, T. A. (2002). A quantitative summary of attitudes toward wolves and their reintroduction (1972–2000). *Wildlife Society bulletin*, 30 (2), 575–584.
- Bjerke, T., Reitan, O., & Kellert, S. R. (1998). Attitudes toward wolves in southeastern Norway. *Society & Natural Resources*, 11(2), 169–178. doi:10.1080/08941929809381070
- Johansson, M., & Karlsson, J. (2011). Subjective experience of fear and the cognitive interpretation of large carnivores. *Human Dimensions of Wildlife*, 16(1), 15–29. doi:10.1080/10871209.2011.535240
- Karlsson, J., & Sjöström, M. (2007). Human attitudes towards wolves, a matter of distance. *Biological Conservation*, 137(4), 610–616. doi:10.1016/j.biocon.2007.03.023
- Ericsson, G., & Heberlein, T. A. (2003). Attitudes of hunters, locals, and the general public in Sweden now that the wolves are back. *Biological Conservation*, 111(2), 149–159. doi:10.1016/S0006-3207(02)00258-6
- Karlsson, J., Sjöström, M., (2011). Subsidized Fencing of Livestock as a Means of Increasing Tolerance for Wolves, *Ecology and Society*, 16 (16).
- Heberlein, T. & Ericsson, G. (2005). Ties to the Countryside: Urban Attitudes toward Hunting, Wildlife and Wolves. *Human Dimensions of Wildlife* 10, 213–227
- Thornton, C., & Quinn, M. S. (2010). Risk perceptions and attitudes toward cougars in the southern foothills of Alberta. *Human Dimensions of Wildlife*, 15 (5), 359–372. doi:10.1080/10871200903582626
- Gore, M. L., Knuth, B. A., Curtis, P. D., & Shanahan, J. E. (2006). Stakeholder perceptions of risk associated with human–black bear conflicts in New York’s Adirondack park campgrounds: Implications for theory and practice. *Wildlife Society Bulletin*, 34(1), 36–43. doi:10.2193/0091-7648(2006)34[36:SPORAW]2.0.CO;2
Gore, M. L., Knuth, B. A., Curtis, P. D., & Shanahan, J. E. (2007a). Campground manager and user perceptions of risk associated with negative human–black bear interactions. *Human Dimensions of Wildlife*, 12(1), 31–43. doi:10.1080/10871200601107882
Gore, M. L., Knuth, B. A., Curtis, P. D., & Shanahan, J. E. (2007b). Factors influencing risk perception associated with human–black bear conflict. *Human Dimensions of Wildlife*, 12(2), 133–136. doi:10.1080/10871200701195985
- Johansson, M., Karlsson, J., Pedersen, E., & Flykt, A. (2012). Factors governing human fear of brown bear and wolf. *Human Dimensions of Wildlife*, 17(1), 58–74. doi:10.1080/10871209.2012.619001

Mind Map 3: Environmental/ecological Risk Perceptions



- 1 Slimak, M. W., & Dietz, T. (2006). Personal values, beliefs, and ecological risk perception. *Risk Analysis*, 26 (6), 1689–1705. doi:10.1111/j.1539-6924.2006.00832.x (See also MM1 # 11)
- 2 Willis, H. H., & DeKay, M. L. (2007). The roles of group membership, beliefs, and norms in ecological risk perception. *Risk Analysis*, 27(5), 1365–1380. doi:10.1111/j.1539-6924.2007.00958.x
- 3 Willis, H. H., DeKay, M. L., Fischhoff, B., & Morgan, M. G. (2005). Aggregate, disaggregate, and hybrid analyses of ecological risk perceptions. *Risk Analysis: An Official Publication of the Society for Risk Analysis*, 25 (2), 405–428. doi:10.1111/j.1539-6924.2005.00599.x
- 4 Sjöberg, L., & Wählberg, A. (2002). Risk perception and new age beliefs. *Risk Analysis*, 22 (4), 751–764. doi:10.1111/0272-4332.00066
- 5 Kellens, W., Zaalberg, R., Neutens, T., Vanneuville, W., & De Maeyer, P. (2011). An analysis of the public perception of flood risk on the Belgian coast. *Risk Analysis: An Official Publication of the Society for Risk Analysis*, 31(7), 1055–1068. doi:10.1111/j.1539-6924.2010.01571.x
- 6 Thornton, C., & Quinn, M. S. (2010). Risk perceptions and attitudes toward cougars in the southern foothills of Alberta. *Human Dimensions of Wildlife*, 15 (5), 359–372. doi:10.1080/10871200903582626

7.4 APPENDIX D: ADDITIONAL ANALYSES

7.4.1 INTERESTING FINDINGS NOT RELATED TO HYPOTHESES.

DIFFERENCES IN RISK PERCEPTION AND ACCEPTANCE BETWEEN SPECIES.

Whether Dutch citizens actually perceive risks concerning wolves as higher compared to those concerning wild boars, and accept these risks less, was not part of any hypothesis, and consequently not reported in the paper above. Yet, for nature managers this can be interesting, thus it is reported here. Independent t-tests show that risk perceptions concerning wolves ($M = 4.91$; $SD = 1.13$) were significantly higher than risk perceptions concerning wild boars ($M = 4.32$; $SD = 1.28$; $t(211) = 6.70$, $p < 0.001$). Additionally, risk acceptance concerning wolves ($M = 3.83$; $SD = 1.40$) was significantly lower than risk perceptions concerning wild boars ($M = 4.41$; $SD = 1.46$; $t(208) = -8.15$, $p < 0.001$). In other words, Dutch citizens perceive wolves to be more risky than wild boars, and they accept the risks concerning wild boars more than risks surrounding wolves.

DIFFERENCES IN RISK PERCEPTION AND ACCEPTANCE BETWEEN SITUATIONS.

In the questionnaire, risk perception and acceptance were measured for three situations, one situation located in one's own backyard, one during a car-trip and a third one during a nature hike/excursion. In order to see whether risk perceptions and acceptance differed for these three situations, the means of the scenario's were compared with each other, two-by two. Thus, scenario 1 was compared to scenario 2, and consequently to scenario 3, and then scenario 2 was compared to scenario 3. This was done for both risk perception and acceptance, and for the scenarios pertaining to wolf-risks and to those relating to wild boar risks. Note that the scenarios for both species were identical, apart from the 'main risk' which was either a wolf or a wild boar. Table 5 below presents the means and standard deviations for each scenario.

The means of scenario 2 and 3 – the car collision and nature excursion respectively – did not significantly differ, but the first scenario of a backyard encounter did differ significantly from the other scenarios in all scenarios (in case of both species, and for both risk perception and acceptance). Risk perceptions concerning wolves and wild boars were all higher in the first scenario, and risk acceptance was in both species' cases higher in the first scenario. This means that people thought the risks of wildlife encounters to be considerably higher when they imagined this to occur in their backyards than elsewhere. Yet, despite this higher risk perception, they also thought it to be more acceptable to encounter these species in their backyards. This can perhaps be explained by the idea that people feel more 'safety' in their own backyards. Such a suggestion, however, merits further investigation into whether this 'perceived safety or familiarity with surroundings' is indeed a factor that can influence risk perception and acceptance.

Table 5: Means & standard deviations for risk perception & acceptance per scenarios per species.

		Mean	SD
Risk perception	wolf	Sc1	5.23
		Sc2	4.58 ^a
		Sc3	4.91 ^{a, c}
	wild boar	Sc1	4.49
		Sc2	4.18 ^b
		Sc3	4.28 ^b
Risk acceptance	wolf	Sc1	4.74
		Sc2	3.87 ^a
		Sc3	3.90 ^a
	wild boar	Sc1	4.02
		Sc2	3.44 ^a
		Sc3	3.36 ^a

Note to Table 5: ^a Scenario differs from scenario 1 with $p < .001$ *; ^b scenario differs from scenario 1 with $p < .01$; ^c scenario differs from scenario 2 with $p < .01$.

Sc1-3 are respectively: encounter with animal in own garden; in a car collision and during a nature excursion. SD means Standard Deviation.

7.4.2 RISK FACTOR ANALYSES.

In the general discussion it was mentioned that the question for the risk factor ‘immediacy of consequences’ might have been difficult to understand for respondents. Two additional factor analyses – excluding the factor on immediacy from the analyses – were done to see what the effects were on the found components/dimensions. Table 6 below presents the factor loadings of the Pattern Matrix of these findings.

Table 6: Pattern Matrix of Factor Analysis on wolves & wild boars without ‘immediacy of consequences’

	Components for wolves		Components for wild boars	
	1	2	1	2
Voluntariness	.59		.53	
Knowledge of exposed	.55		.77	
Knowledge of science	.63		.47	.44
Control	.72		.75	
Newness		.85	.69	-.47
Catastrophic potential	.67	.37		.80
Dread	.55	.38	.50	
Severity of consequences	.59		.60	

Note to Table 6: Rotation method: Direct Oblimin, Eigenvalues > 1. Loadings > 0.364 are noted.

Quite similar to the previous findings, in both the case of the wolves and wild boars, two components/dimensions are identified. This means that even despite the fact that the second question might have been misunderstood, the two-component results stand firmly for this study. Even though not exactly replicating the Dread and Newness dimensions of Slovic (1987), the notion of more than one 'overarching' dimension to risk is supported by this additional analysis.

In the case of risk factors to wolf-related risks, the factor loadings on the second dimension are only just above the cut-off point for the factor dread and catastrophic potential. When considering the factor 'newness' as the only convincing factor on this dimension, the second dimension can thus be named 'Newness' (although not exactly the same as Slovic's dimension on Newness, because the latter also contained the risk factors knowledge – of exposed and science). The first dimension is a collection of all other risk factors – excluding immediacy and newness – and no specific name can therefore be given; it contains many different factors in one dimension.

A peculiarity in the factor analysis for wild boars is that whereas in the initial analysis the factor immediacy of consequences was assigned to the second dimension separately from all the other factors (see Table 3), but in the new factor analysis – taking immediacy out of the equation – the second dimension was 'filled' with other factors, such as knowledge of science, newness and catastrophic potential. This suggests that this separation into two dimensions in the first factor analysis (Table 3) was obscured by the dramatic factor loading of immediacy. After deleting immediacy from the analysis more subtle differences in the risk factors could be detected, resulting in the first dimension containing nearly all the risk factors – similar to the wolf risk factors – and a second dimension containing to a high degree the catastrophic potential, and to a lesser degree knowledge of the scientific community and newness (the latter inversely so).

Whereas the analyses on the wolf risk factors above did show some resemblance to – although not an exact replication of – Slovic's dimensions, the results of the factor analysis on wild boars has no resemblance whatsoever to Slovic's dimensions. A reason for this might be that in the case of wild boar risks, questions related to newness and knowledge of the scientific community may have been found irrelevant by respondents, because most people simply do not see the 'risk' in encountering a wild boar. On the other hand, it may also be the case that the risk dimensions of prior psychometric research, such as Slovic's, is just not applicable to all risks equally. It could be the case that for natural-born risks such as wildlife encounters, very different dimensions are relevant indeed than in other more human-induced risks. Or it could be that risk dimensions are not so much dependent on the aspects of a risk (whether it is human-induced or natural-born) but more dependent on a culture, whether it is measured in the Netherlands, or in the USA. Such questions, however, cannot be answered with the data gathered in this study. If answers to these questions are found relevant and needed, further studies ought to be set-up to further investigate this. For now, this Appendix concludes with the insight that risks can be explained by a multitude of factors, and that often these factors will be highly related to one another, often in one or a few clusters or 'dimensions'.