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<p><b>TITLE:</b></p> <p>Sensation Seeking in Nature-Based Tourism: The Utility of a Personality Variable in Explaining Motives and Attitudes to Management in Natural Areas</p>
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### **Abstract**

Natural area managers are facing challenges to combine increasing visitation as nature-based tourism is growing with the protection of the natural resources. This thesis therefore aimed at contributing to solve this empirical problem through advancing the understanding of visitors to natural areas with the help of the personality variable sensation seeking, which despite its potential in tourism research has been applied only limitedly in the context of natural areas. Specifically, the conceptual model of the thesis examined the relationship between sensation seeking, measured by the Brief Sensation Seeking Scale (BSSS), and the motives to visit natural areas and the attitudes to natural area management, which were partly derived from Galloway and Lopez (1999) and extended with findings from other studies on nature-based tourism. To test the model a quantitative research design in form of a survey with a convenience sample of respondents approached at a natural area near the Norwegian city of Stavanger was conducted. Based on the analysis with responses from 151 participants, statistically significant positive relationships between the sensation seeking score and the physical motive of preference for stimulating and/or challenging activities, the wildlife motive of actively seeking wildlife, the focus on self motive of having time to reflect on life and the preference for eating in untouched areas as part of the management of facilities, as well as a statistically significant negative correlation between sensation seeking and the wildlife motive of avoiding potentially dangerous animals were found. Consequently, there was a limited number of significant relationships, which might result from the limitations of the study, including the analysis on the item level. Nevertheless, the thesis provided potential points of departure for further research in the context of natural areas and found support for the reliability and validity of the BSSS measuring sensation seeking. In addition, implications for the management of natural areas were derived.

*Keywords:* sensation seeking, nature-based tourism, outdoor recreation, natural area management, motives, attitudes, sustainability, Norway

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### **Foreword**

The basis for this research stemmed from my interest in outdoor activities like hiking, which was also a reason for my choice to study my master degree in Norway with its many great nature experiences. It was therefore also my wish to write my thesis in the context of nature tourist experiences. Considering the current developments and the fast-moving society, nature offers a place to escape from these pressures and to find restoration, it is therewith understandable that people increasingly spend their time in nature and that nature-based tourism is growing. Nevertheless, these increasing visitations can also cause damages to the natural environment, which I witnessed personally when going hiking. This is why my aim was to contribute with my thesis to a better understanding of visitors to nature areas in order to advance knowledge on how to conduct sustainable natural area tourism, so that also future generations can experience the benefits of spending time in nature. Especially with the awareness of climate change and its consequences rising, conducting sustainable tourism in natural areas becomes an urgent concern. Having a personal interest in the topic of the thesis was definitely beneficial in the thesis writing progress, in which I was able to expand my knowledge on the challenges natural areas are facing through the perusal of the respective literature and the results of my study.

In this regard I also want to express some acknowledgements for the support that contributed to the completion of this thesis. I want to thank my supervisor Torvald Øgaard for his advice on the conduction of the thesis and the instructive meetings. Thanks also go to the University of Stavanger and in particular to the Norwegian School of Hotel Management for accepting me to the master programme International Hospitality Management and for three semesters of interesting and informative courses and the support during the thesis writing process. Furthermore, I also want to express my acknowledgement to the respondents of my survey, who took the time to fill out questionnaires, even in harsh weather conditions, and

whose kindness and responsiveness really surprised me. Even though the data collection with spending many hours standing outside waiting for respondents turned out to be a personal challenge, it was a rewarding experience, especially through realising the friendliness and helpfulness of the people approached and the nice conversations that developed. Finally, I also want to thank my family, who always supports me in my endeavours, for their love and understanding, and my friends for their company on many hiking trips and for sharing my interest in nature experiences.

### **Introduction**

Nature-based tourism is increasing and a quest for nature experiences is apparent worldwide (Balmford, Beresford, Green, Naidoo, Walpole & Manica, 2009, p. 1; Buckley, 2000, p. 442; Cohen, E., 2008, p. 332). This is a positive development in that regard that time spent in nature positively affects physical well-being (Kaplan & Kaplan, 1989, p. 173), and contributes to substantial stress reduction and mental rejuvenation (Cole & Hall, 2010, p. 806). In addition, nature-based tourism has the potential “to generate funds for conservation and to shape people’s attitudes to the environment” (Balmford et al., 2009, p. 1). Furthermore, nature-based tourism provides opportunities for economic development, which is particularly important for rural areas affected by structural changes (Haukeland, Daugstad & Vistad, 2011, p. 14; McCool, 2009, p. 134). Nevertheless, increasing visits to nature areas can negatively impact the resources that are preserved in the areas, either through the visitors themselves or through the infrastructure accompanying increasing visitor numbers (McCool, 2009, p. 133). Possible negative effects include pollution, littering, quantitative decrease of natural resources, damaging of soil and vegetation, endangerment of wildlife and the destruction of natural landscapes (Musgrave & Dávid, 2011, p. 211; Zeidenitz, Mosler & Hunziker, 2007, p. 175). Therewith, tourism could “cause the destruction of those natural elements that form the basis of these tourist products” (Musgrave & Dávid, 2011, p. 211).

Consequently, there is a challenge of combining the provision of access to nature areas and ensuring the enjoyment of recreational opportunities for visitors with the preservation of the natural environment (Garms, Fredman & Mose, 2017, pp. 239-240; McCool, 2009, p. 134). In order to solve this potential conflict, it is necessary to ensure that natural area tourism is conducted in a sustainable way, meaning that the natural resources of tourism are preserved in a way that benefits present societies but also protects future utilization of these resources (Musgrave & Dávid, 2011, p. 213), so that also future generations can obtain the above

mentioned recreational benefits of natural areas (Svarstad, 2010, p. 103). This requires to develop an understanding of visitors to nature areas (Eagles, 2007, p. 38; Galloway, 2002, p. 581). In particular understanding differences in motives for visiting natural areas is of interest for implementing viable marketing programs and therewith to convince different visitors of the benefits of being outdoors in nature (Galloway, 2002, p. 581). In this regard, market segmentation can be mentioned, which is defined as the “process of identifying people with similar needs, wants and characteristics, and putting them into groups based on selected characteristics” (Tangeland, Aas & Odden, 2013, p. 192), since “segment-oriented visitor information may better reach visitors” (Sievänen, Neuvonen & Pouta, 2011, pp. 68-69). Another important aspect is to explain differences in attitudes to management of nature areas to develop an acceptable management policy, because negative attitudes could lead to conflicts over visitor management (Arnberger, Eder, Alex, Sterl & Burns, 2012, pp. 48, 54). In addition, knowing why visitors to natural areas differ in their motives and attitudes has practical relevance, as it can assist authorities and natural area managers in creating actions to ensure that outdoor activities have the least possible impact on the natural resources and in initiating strategies to increase awareness about natural environments and therewith foster environmentally responsible behaviour (Kil, Holland & Stein, 2014, p. 16; Zeidenitz et al., 2007, p. 176).

In order to achieve these practical benefits, the application of previous research and study findings in the context of natural areas is necessary. There is a well-established body of literature on outdoor recreation and nature-based tourist experiences (Eagles, 2014, p. 528; Vespestad & Lindberg, 2011, p. 563), and several studies regarding motives and attitudes to management in nature areas exist, which are presented in the literature review. However, there is remarkably little research on the psychology of tourism according to Eachus (2004, p. 142), even though a growing list of psychographic characteristics has gained research interest

in tourism through the years, one of which is the personality trait sensation seeking (Litvin, 2008, p. 440). Previous studies found support for the potential usefulness of sensation seeking as a psychometric tool in tourism research (Pizam, Reichel & Uriely, 2001, p. 22), including the explanation of tourism motivation and predictions regarding travel (Pizam et al., 2004, p. 253). Furthermore, previous studies found sensation seeking to be a useful segmentation tool for tourism markets (Lepp & Gibson, 2008, p. 748). Even though several tourism studies have incorporated the sensation seeking trait (Litvin, 2008, p. 444), there have not been many studies in the context of nature-based tourism that included this concept. To the few examples of studies applying sensation seeking in the context of nature areas belong a study by Galloway and Lopez (1999) that examined the relationship between sensation seeking and the attitudes to various characteristics of national parks (p. 665), another study by Galloway (2002) that also provided support for the usefulness of the personality construct sensation seeking in identifying differences in the attitudes of national park visitors (p. 253), as well as a study by Pomfret (2006) that identified sensation seeking as a key personality trait that influences participation in the outdoor recreation activity mountaineering (p. 118), among other studies that are presented in the literature review.

Consequently, despite the apparent usefulness of sensation seeking as an explanatory variable in tourism research, there seems to be a lack of research applying this personality construct in the context of nature-based tourism. This study therefore aims at contributing to close this research gap by testing the construct sensation seeking and the corresponding theory in the context of natural areas and therewith to add knowledge to solve the empirical problem of understanding visitors to natural areas as indicated above, specifically to explain their motives to visit nature and their attitudes to natural area management. In particular, the research questions of the thesis are formulated as the following:

Research Question 1a: Are there significant relationships between sensation seeking and the motives for visiting natural areas?

Research Question 1b: Can sensation seeking explain a significant amount of variance in the motives for visiting natural areas?

Research Question 2a: Are there significant relationships between sensation seeking and the attitudes to the management of natural areas?

Research Question 2b: Can sensation seeking explain a significant amount of variance in the attitudes to the management of natural areas?

In addition, the above mentioned studies of Galloway and Lopez (1999) and Galloway (2002) applied the construct sensation seeking in the context of national parks, but nature does not only refer to distant natural environments but also to natural settings nearby urban areas, as according to Kaplan and Kaplan (1989) experiences sought and benefits derived are similar for both settings (pp. 118-119). By locating this study in a local hiking area nearby the city of Stavanger, the thesis also advances the knowledge on the applicability of sensation seeking as a psychometric tool in natural area tourism in another nature setting than national parks. This is also supported by the trend that the growth of tourism in protected areas to a scale where it jeopardizes conservation objectives and leads to overcrowding produces opportunities for tourism in other public and private lands that are less publicised, which is especially applicable to the Nordic context due to the Right of Public Access (Balmford et al., 2009, p. 3; Buckley, 2000, p. 438; Fredman & Tyrväinen, 2010, p. 179). Therewith the focus of this study is also more on outdoor recreation, as it can be assumed that visitors to nearby nature areas are less likely to stay overnight (Pomfret & Bramwell, 2016, p. 1447). Nevertheless, as outdoor tourists and recreationists share very similar characteristics and are difficult to differentiate (Fredman & Tyrväinen, 2010, p. 179; Pomfret & Bramwell, 2016, p. 1448), the concepts of tourism and recreation are used interchangeable during the thesis.

Furthermore, many studies on sensation seeking in tourism were conducted with college students in the United States (U.S.), whereas the sample of this study was approached in a natural area near the Norwegian city of Stavanger and therefore another contribution of this thesis is the use of a sample in a non-U.S. setting with different sociodemographic characteristics than a student sample (Litvin, 2008, p. 445).

In the following, the history of research on sensation seeking and the corresponding relevant literature as well as additional research on tourism and recreation in natural areas is presented. Subsequently, the conceptual model of the thesis is described, that was developed based on previous research, and then the methodology for examining the model is outlined. This is followed by the results of the data analysis and a discussion of the findings, including the formulation of possible theoretical, methodological and managerial implications.

## **Literature Review**

### **Outline of the Literature Review**

Considering the research questions outlined above, the literature review focuses on the one hand on the history of research on sensation seeking, in general and in the context of tourism, and on the other hand on the history of research on natural area tourism, particularly on the motives and attitudes to management in the context of nature-based tourism. The aim of the literature review was to synthesize this research in order to develop a conceptual model for examining the utility of sensation seeking in explaining the motives and attitudes to management in the context of natural areas and therewith to answer the research questions and to contribute to fill the research gap identified in the introduction. As the experiences sought for and the benefits derived are similar for distant natural environments and nearby, everyday natural settings (Kaplan & Kaplan, 1989, pp. 118-119), the literature review also includes studies performed in the context of national parks, even though the thesis was directed at local natural areas. First, literature on the sensation seeking theory is reviewed, then the application of this theory in the tourism context is examined, subsequently, findings

from natural area tourism research are presented and finally, the research findings are combined in the conceptual model.

### **Sensation Seeking Theory**

The research on sensation seeking was led by Marvin Zuckerman, which he summarized in his book “Sensation Seeking: Beyond the Optimal Level of Arousal” (1979). The idea of the sensation seeking trait emerged from Zuckerman’s (1979) attempt to provide a framework for explaining data on individual differences in relation to sensory deprivation experiments (p. 3). In addition to these scientific observations, also less scientific observations of his surrounding and questions like why some people engage in risky sports or potentially addictive behaviours whereas others behave in tension-reducing and fear-avoidant ways led to the definition of the construct of sensation seeking (Zuckerman, 1979, pp. 2-3). Regarding the theoretical background that preceded the development of the construct of sensation seeking and the corresponding theory, Zuckerman (1979) referred to a range of optimal level of stimulation and arousal theories including Hebb’s (1949) and Berlyne’s (1960) optimal level theories (pp. 12-56). As Lepp and Gibson (2008) pointed out the premises of these theories, namely that individuals differ in their optimal level of stimulation and that this preference shows stability over time, were the basis for Zuckerman’s (1979) research (p. 740). Zuckerman applied these optimal level theories to explain the results of sensory deprivation experiments and found support that prolonged deviations from normal levels of arousal produce emotional, cognitive, and behavioural disturbances and that in the absence of varied stimulation, individuals will engage in behaviour that increases stimulus input, which led to the development of his personality theory of sensation seeking and the sensation seeking scale (pp. 91-94). Later on, Zuckerman (1979) also developed a biological model of sensation seeking to explain how genetic bases lead to different manifestations of the sensation seeking trait (pp. 374-379).



Based on this research, Zuckerman (1979) provided a definition of sensation seeking as “a trait defined by the need for varied, novel and complex sensations and experiences and the willingness to take physical and social risks for such experiences” (p. 10). Consequently, according to Zuckerman (1979) a high optimal level of stimulation is indicative of sensation seekers while sensation avoiders are characterized by a low level of optimal stimulation (Weber, 2001, p. 371). The Sensation Seeking Scale Form V, which Zuckerman (1979) developed over a period of three decades, measures both the overall construct of sensation seeking and its four underlying subfactors: Experience seeking, the desire to seek new sensations; Boredom susceptibility, the aversion to the routine; Thrill and adventure seeking, the desire to engage in risky and adventurous behaviours; Disinhibition, the need to seek social stimulation (Litvin, 2008, p. 441). Regarding the measurement of sensation seeking, alternative scales have also been proposed to address the limitations of Zuckerman’s scale (Litvin, 2008, pp. 441-442), that are presented later in more detail when the sensation seeking concept is operationalized. Several studies have linked sensation seeking with the participation in a variety of stimulating events as well as with various beliefs and behaviours and in this regard sensation seeking has also been considered by tourism researchers (Litvin, 2008, p. 440).

### **Sensation Seeking in Tourism**

According to Litvin (2008), it is unlikely that sensation seeking appears as the primary variable in tourism research, rather it is applied as an explanatory variable to explore tourism behaviour (Litvin, 2008, p. 442). One of the earliest studies applying the concept of sensation seeking in the context of tourism, is the study by Fontaine (1994) that examined the motives of students for international travel and found support that at least the Experience Seeking subscale might explain some of the travel motivation (pp. 1584-1585). Eachus (2004) also identified that sensation seeking is predictive of holiday preference (p. 141). In addition,

sensation seeking was analysed with regard to adventure activities, so did Gilchrist, Povey, Dickinson and Povey (1995) find that adventure travellers scored significantly higher on the Total Zuckerman Sensation Seeking Scale and the Thrill and Adventure Seeking and Experience Seeking subscales (p. 516). Furthermore, Pizam et al. (2001) analysed the effects of sensation seeking on the choice of tourist activities and preferred travel arrangements and found that respondents who preferred to participate in extreme sports while on a leisure trip, had higher sensation seeking scores than those who preferred to visit natural attractions (p. 17). In a following study, Pizam et al. (2004) then examined the relationship between the combined psychological characteristics of risk-taking and sensation seeking and the travel behaviour of young adults with the result that respondents who scored high on the combined risk-taking sensation seeking scale (RSS) had a significant higher frequency and likelihood of engaging in hiking, camping, wilderness hiking and mountaineering among other activities and that consequently respondents who scored high on the RSS index preferred mostly high-energy, outdoor-type activities (pp. 255-258). Based on these studies it can be identified that natural areas are potentially attractive to both high and low sensation seekers, as they offer opportunities for activities that are preferred by high sensation seekers like hiking and mountaineering as well as those preferred by low sensation seekers like visiting natural attractions.

There are also studies applying the construct of sensation seeking specifically in the natural area context as indicated in the introduction. Galloway (1998) highlighted the conceptual weaknesses in the leisure travel motivation research and suggested to study the relevance of motivation to travel behaviour within the framework of personality theories and specifically recommended to study sensation seeking with regard to motivations to visit natural areas, as sensation seeking is positively related to a variety of behaviours that are relevant in the study of natural area tourism (pp. 99-100, 104). Galloway and Lopez (1999)

then examined the relationship between the personality construct sensation seeking and the attitudes to various aspects of national parks, whereas the destination characteristics were chosen based on analyses of the motivations for leisure travel behaviour (pp. 665-666). As a scale to measure sensation seeking, the Arnett Sensation Seeking Scale (1994) was applied to a sample of college students and significant relationships between scores on the Intensity subscale and attitudes to visiting remote parks, structured tours, presence of dangerous animals, seeking wildlife and stimulating/challenging activities, and between scores on the Novelty subscale and attitudes to visiting remote parks, importance of picnic/BBQ facilities, meeting interesting and like-minded people and eating in untouched areas of parks were found (Galloway & Lopez, 1999, p. 665). In another study, Galloway (2002) examined whether a segmentation in terms of sensation seeking enables to identify differences between park visitors in park-related attitudes and behaviours, but instead of using an existing sensation seeking scale of the literature, a cluster analysis of visitors to parks in Canada based on attitudes to three dimensions of park experiences (active enjoyment of nature, escape stress, sensation seeking) was conducted and resulted in three clusters of visitors (p. 581). It was found that higher sensation seekers differed from both groups of lower sensation seekers on a broad variety of attitudes and behaviours to do with parks, specifically significant differences between high and low sensation seekers included the frequency of visits, incentives to visit the park, involvement in activities during park visits and importance of facilities and services (Galloway, 2002, p. 581).

As a consequence, the analysis of visitors to natural areas with regard to sensation seeking seems to have substantial potential to enhance the marketing and management of such areas as well as to increase park user safety, satisfaction and sustainability of the destination usage and therewith to address the challenges natural area managers are currently facing (Galloway, 2002, p. 581; Galloway & Lopez, 1999, p. 665). The applicability of sensation

seeking in the context of natural area tourism is also supported by findings of She, Tian, Lu, Eimontaite, Xie and Sun (2019) who identified sensation seeking as a significant predictor of hiking preference, more specifically the preference for laid-back versus adventurous hiking routes (p. 9). Furthermore, with regard to outdoor adventure recreation activities, Ewert, Gilbertson, Luo and Voight (2013) recognized sensation seeking as part of the underlying motivational structure for participation in four different adventure recreation activities (p. 103), and Pomfret (2006) pointed out that personality attributes like sensation seeking are a key influence on the participation in mountaineering (p. 115).

In conclusion, previous research supports the application of the sensation seeking theory in the natural area context, as on the one hand previous studies found sensation seeking to be a useful psychometric tool in tourism research, but on the other hand the number of studies applying the personality construct sensation seeking in the natural area tourism context is limited, therewith presenting a research gap, which this thesis aims at contributing to close. In the following, additional studies on natural area tourism, specifically regarding the motives and attitudes to management, are presented to gain further insights for the conceptual model development.

### **Natural Area Tourism**

Before reviewing the literature on natural area tourism, it is necessary to distinguish between natural and built environments. According to Newsome, Moore and Dowling (2002) “natural environments are those areas that on the whole tend to retain their natural characteristics and are not modified to any large extent by human interference with the natural landscape or processes” (p. 3). This includes settings of natural vegetation that are found naturally in the landscape or that are preserved in protected areas (Newsome et al., 2002, p. 3). In contrast, “built environments are human altered areas where the natural environment has been modified to such an extent that it has lost its original characteristics and has been

transformed into human created places and spaces” (Newson et al., 2002, p. 3). Consequently, natural areas are regions which have not been significantly modified by humans and therewith their landforms, wildlife and ecological processes are largely found in their natural state (Newson et al., 2002, p. 3).

In addition, it is necessary to provide a definition of tourism and recreation. According to Mathieson and Wall (1982) “tourism is the temporary movement of people to destinations outside their normal places of work and residence, the activities undertaken during their stay in those destinations, and the facilities created to cater to their needs” (p. 1). As according to Boniface and Cooper (1987) recreation includes the activities engaged in during leisure time, meaning the time that is available to an individual after basic needs have been met, tourism can be understood as one of those recreation activities (p. 1), and conversely a central part of the tourism experience usually focuses on recreation activities (Newson et al., 2002, p. 6). Consequently, these concepts are used interchangeably throughout the thesis as already mentioned previously and therewith the literature review on natural area tourism also includes studies about outdoor recreation.

Furthermore, natural area tourism, defined as including “all those tourists who left home for the natural ambient/areas/environment”(Musgrave & Dávid, 2011, p. 211), encompasses different types of tourism, including nature-based tourism, in which the viewing of natural landscapes is the primary objective, wildlife tourism that has the viewing of wildlife as the primary objective, adventure tourism, in which the emphasis is on the activity, and ecotourism that includes educative and conservation supporting elements (Newson et al., 2002, p. 11). Even though the aim of the thesis was to develop a conceptual model applicable to natural areas in general, as the study was conducted in the Norwegian context and there are not many opportunities for viewing diverse wildlife because other animals than elk and deer are very rare and only found in less populated areas (Stavanger Chamber of Commerce, 2019,

p. 6), this form of natural area tourism was not focussed on in the literature review and instead literature was sought that is applicable to natural areas in general, including nearby, natural areas in Norway without diverse wildlife. The specific area where the data collection took place, near the city of Stavanger, offers with several climbing opportunities the possibility to engage in adventure activities (Stavanger & Ryfylke Regions, 2020), nevertheless as for adventure tourism the focus is on the activity and the natural setting is more incidental (Newson et al., 2002, p. 12), as well as due to the aim of developing a conceptual model applicable to natural areas in general, literature on this type of natural area tourism was also not in focus in the review. Considering that nature-based tourism is sometimes perceived as synonymous with ecotourism due to having protecting natural areas and fostering an understanding of the natural environment as one of its aims and that ecotourism is not clearly defined and sometimes viewed as an ideal or marketing tool (Newson et al., 2002, pp. 13-15), or alternatively seen as a normative subcategory of nature-based tourism (Fredman & Tyrväinen, 2010, p. 180), the thesis was placed in the context of nature-based tourism, on which more literature is presented in the following. Even though it must be noted that, despite wildlife and adventure tourism not being the focus of the literature review, items related to viewing wildlife and engaging in activities were also included in the conceptual model as is later described in more detail since they are still part of tourism in natural areas. Next to providing definitions of natural and built environments and natural area tourism, Newson et al. (2002) also pointed out the possible ecological impacts of natural area tourism, including trampling with consequences on vegetation and soil as well as impacts associated with access roads, trails and the construction and operation of built facilities like camp grounds which might cumulate to a larger impact situation (pp. 83-135), corresponding to the possible damages to the environment through increasing visitations to nature outlined in the introduction and illustrating the necessity of conducting nature-based tourism in a sustainable

way. Subsequently, research on nature-based tourism in general, in the Nordic and specifically in the Norwegian context as well as on the motives and attitudes to natural area management is presented.

### **Nature-Based Tourism**

**History of research.** Regarding the history of research on nature-based tourism, Valentine (1992) described the focus on nature-based tourism in research as a recent phenomenon in his review (p. 107). With regard to the prospects of nature-based tourism, Valentine (1992) mentioned that whilst there are environmental and social limits to nature-based tourism, the economic potential may be quite high, additionally, the author also examined the problems associated with nature-based tourism including environmental impacts, community and social impacts as well as a leakage of benefits to local communities and therefore pointed out the need for ecological sustainable development and suggested possible guidelines for integrating nature-based tourism and conservation (pp. 111-117, 120-122). Since then nature-based tourism has experienced even more growth, partly due to the commercialisation of outdoor recreation and the increasing popularity of nature-based activities (Buckley, 2000, p. 442). This is accompanied by a growing number of research articles related to nature-based tourist experiences (Vespestad & Lindberg, 2011, p. 563). Based on a review of these articles, Vespestad and Lindberg (2011) derived four perspectives on nature-based experiences, one of them being nature-based experiences as a state of being, meaning that tourists engage in these recreation activities to reach psychological and physical goals and to achieve a new state of being, in which regard the authors also mentioned the concept of sensation seeking (pp. 563, 571-572, 576), therewith offering further support for the application of this theory in the context of nature-based experiences. Moreover, Elmahdy, Haukeland and Fredman (2017) identified several trends influencing nature-based tourism consisting of social trends like an ageing population, urbanisation and more emphasis on

mental health, technological trends, economic trends, environmental trends, in particular climate change, and political trends (pp. 5-9), thereby demonstrating the relevance of current research on nature-based tourism.

Fredman and Tyrväinen (2010) developed a model illustrating the principles and operation of the nature-based tourism system including visitors to nature areas, the supply side consisting of natural resources as well as products and services provided in that context like accommodation, visitor centres and guides, the local community that is often highly integrated with the tourism supply and also external factors like rules and regulations, other competing resource uses, climate change, economic recessions and safety (pp. 177-178), which indicates the complexity of the nature-based tourism system, making the achievement of a sustainable nature-based tourism challenging and respective research even more crucial. In addition, Fredman and Tyrväinen (2010) specifically referred to the Nordic region and identified characteristics that are valid for large parts of this region, namely high amounts of rural and peripheral areas, an increasing rate of urban population that demands recreation opportunities in the proximity of cities and the Right of Public Access that allows access to privately owned land for traditional use of nature in contrast to other countries where nature-based tourism often takes place only in designated areas (p. 179).

Regarding the context of the thesis, there are also further studies on nature-based tourism specifically conducted in a Norwegian context, including a study by Haukeland et al. (2011) exploring local stakeholders' views on issues associated with tourism development in Norwegian national parks as well as a study by Haukeland, Grue and Veisten (2010) on foreign tourists' quest for facilities in Norwegian national parks related to their expressed nature orientations, which resulted in scales for nature orientation and quest for facilities that were then further applied by Haukeland, Veisten, Grue and Vistad (2013) to compare the explanatory power of these scales with the Wilderness Purism Scale and the New Ecological



Paradigm Scale and different sociodemographic characteristics to explain visitors' tolerance of potential negative ecological impacts from tourism activities and facilities on particular species of wildlife and vegetation in a Norwegian national park context. According to Haukeland et al. (2010) the image of various tourism sites in a Scandinavian context is associated with natural attractions and the possibilities for nature-based activities (p. 249), and Haukeland et al. (2011) pointed out that more than 16 percent of Norwegians land mass is currently protected and is mainly covering mountainous areas that have been subject to minimal impact (p. 14), showing the significance natural areas have in the Norwegian context. Although Haukeland et al. (2013) also demonstrated the potential negative environmental impacts resulting from tourism activities and facilities (pp. 292, 307), thereby providing support for Norway as a suitable location to examine the utility of the sensation seeking theory in understanding visitors to natural areas and therewith to address the empirical problem outlined in the introduction. The suitability of the Norwegian context for this study is also supported by Svarstad (2010) who illustrated the importance of hiking and other outdoor recreation activities in Norway to the extent that they can be interpreted as a more or less ritualized activity (pp. 91-92, 106). In this regard, Bjerke, And and Kleiven (2006) also pointed out the need for further research on Norwegian leisure patterns and how they relate to environmental values, which has concrete practical relevance (p. 120).

Consequently, nature-based tourism is an interesting research field, that builds on available research but that also entails the need for further research, especially for theoretically-oriented research in the Nordic countries (Fredman & Tyrväinen, 2010, pp. 181-183; Valentine, 1992, pp. 122-124). In the following, studies regarding the specific research questions, namely the motives and attitudes to management in natural areas are presented. As in the context of nature-based tourism a substantial body of research on national parks is

available (Eagles, 2014, p. 528), this review also encompasses studies conducted in the context of national parks.

**Motives in the context of nature-based tourism.** A motive is defined as “the global integrating network of biological and cultural forces which gives value and direction to travel choice behaviour and experience” (Pearce, Morrison & Routledge, 1998, as cited in Garms et al., 2017, p. 241). With regard to the distinction between motives and motivations, motives tend to be more global, less situation specific and are referred to as generic energizers of behaviour, meaning an understanding of what energizes tourists to particular activities is sought, whereas motivations include the distinct situational parameters in which the motives are expressed and therewith focus on the observable and objectively measurable (Gnoth, 1997, p. 291). As “motives turn into motivations when coupled with both situations and a tourist’s value system” (Gnoth, 1997, p. 299), the concepts are used interchangeable through the thesis.

Some studies in the nature-based tourism context applied the push and pull framework for examining tourists’ motivations (Kim, Lee & Klenosky, 2003, p. 170; Scholtz, Kruger & Saayman, 2013, p. 3). The conceptual framework encompassing these push and pull related motives was developed by Crompton (1979, pp. 408-410). Push factors are defined as “person-based determinants of behaviour and comprise such well-known socio-demographic characteristics as age, income, education, sex and occupation, as well as a variety of psychological variables which can be grouped under the headings of needs, personal values and personality” (Galloway, 2002, pp. 581-582). Pull factors are defined as “motives aroused by the destination rather than emerging exclusively from within the traveler himself” (Crompton, 1979, p. 410). Scholtz et al. (2013) determined why people visited the Kruger National Park during an economic recession and identified through factor analysis six motive categories based on the push and pull framework (pp. 1, 6). In an Asian context, Kim et al.

(2003) studied the reasons for visiting Korean national parks and found four push factor domains and three pull factor domains (p. 169). Nevertheless, as push and pull factors simultaneously affect tourist decisions (Scholtz et al., 2013, p. 3), which makes a clear distinction between push and pull factors difficult, and as pull factors are likely to be different between locations (Kim et al., 2003, p. 171), which is also disadvantageous to this thesis' aim of developing a conceptual model applicable to natural areas in general, a distinction of the motives in push and pull categories was not applied, still these studies provided insights for the choice of the categories for the conceptual model.

Another perspective in motivational research builds on conceptual and empirical work dealing with the Recreational Experience Preference (REP) Scale (Garms et al., 2017, p. 240), that was developed to measure the desired goal states that are achieved through recreation, with a focus on outdoor recreation that occurs in highly natural settings (Manfredo, Driver & Tarrant, 1996, pp. 188, 209). Garms et al. (2017) investigated the travel motives of German visitors to a Swedish National Park and found five motivational factors based on a reworked REP Scale (pp. 244, 247-252), which provided potential motivational classes to be included in the conceptual model in addition to the motives derived from studies examining sensation seeking in the context of natural areas. Kil et al. (2014) also used the REP Scale to select recreational motivations for their study of the relationship between environmental attitudes, recreation motivations and environmentally responsible behaviour (pp. 16-17, 20). This specific applicability of the REP Scale to examine nature-based and outdoor recreation motivations made it a useful tool for the development and verification of the motive categories of the conceptual model as is later described in more detail. As a result, examining the motives of visitors seems to have substantial value in understanding recreation behaviour and therewith for the marketing and management of natural areas, for example regarding the design of marketing programs, the choice of facilities and information and the sustainability

of destination usage (Galloway, 2002, p. 581; Garms et al., 2017, p. 254; Kil et al., 2014, p. 24).

**Attitudes to management in the context of nature-based tourism.** Another focus of the literature review is on attitudes, which were previously identified as an important aspect of understanding visitors to natural areas. Attitudes are defined as “a psychological tendency that is expressed by evaluating a particular entity with some degree of favour or disfavour” (Egaly & Chaiken, 1993, as cited in Kil et al., 2014, p. 17). An example of a study investigating the attitudes of visitors to management in natural areas, is the study by Arnberger et al. (2012) who explored the attitudes of different visitor segments towards visitor and environmental management in an Austrian national park and found four underlying dimensions of visitors’ attitudes towards protected area management including “protection of nature” and “guidance of visitors” (pp. 48, 51-52), that presented possible categories for the conceptual model. Huang, Deng, Li and Zhong (2008) also examined attitudes, specifically visitors’ attitudes towards the roles and functions, the policy and the appropriate uses of China’s National Forest Parks (p. 68). The previously mentioned study by Haukeland et al. (2010) examined preferences for actual facilities in Norwegian national parks and therewith also has implications for visitor management, concretely the authors found four dimensions regarding the quest for facilities, namely “tracks & signposts” including the claim for improved tracks and better signposting, “infrastructure & service” with demands for large physical installations like cable cars, “food & accommodation” and “tours & interpretation” encompassing guided tours and visitor centres (pp. 252-253, 258-259). Furthermore, Papageorgiou (2001) recommended a combined park management framework based on regulatory and behavioural strategies, whereas the regulatory management practices refer to restrictions of visitor actions, access, times and numbers while the behavioural orientation refers to the value of education to confer meaning to nature, enhance knowledge in the short

run and modify behaviour in the long run (pp. 61-63). The significance of education as a conservation tool by reducing inappropriate visitor behaviour and minimising environmental impacts was certified by various researchers, but there is still the need for further research with regard to park management according to Papageorgiou (2001, pp. 63, 71-72).

The findings of these studies were used in the development of the conceptual model and the formulation of the questionnaire items. Nevertheless, in the previously mentioned studies the natural areas were protected by a national park status, whereas natural environments nearby urban areas that are the focus of this thesis are less likely to be protected, for example through a national park status, but they are also impacted by the effects of tourism and recreation taking place in these areas like littering, damaging to soil and vegetation and disturbance of wildlife habits (Zeidenitz et al., 2007, p. 175). Studies examining attitudes to regulation in a non-national park context include research by Zeidenitz et al. (2007) that evaluated concrete intervention measures to further ecologically responsible behaviour (p. 175). According to Zeidenitz et al. (2007) the most suitable approach is a combination of appeals, to encourage people to behave in a desired way, brief information, that explain the necessity of the desired behaviour, and an infrastructure that enables people to actually engage in the desired behaviour (p. 188). Another study on natural areas is that by Denstadli, Lindberg and Vistad (2010) that was specifically dealing with hiking trail impacts and management preferences and the consensus of different stakeholders regarding this in a Norwegian community (p. 358). Denstadli et al. (2010) found that respondents were tolerant of trail impacts even though they differentiated between levels of impact and that indirect methods like provision of information were preferred over direct methods like regulations and fees (pp. 368-369). The opposition to fees was particularly strong, which the authors explained with the Norwegian tradition of open access and the corresponding access to nature on either private or public land in Norway without charging fees, which might also “be the

cause of greater support for actions that limit on-site activities rather than restricting access to the sites themselves” (Denstadli et al., 2010, p. 369). This corresponds with the findings of Papageorgiou (2001) and Zeidenitz et al. (2007) that management of natural areas should also encompass strategies focussed on education and information and not only regulatory approaches. Consequently, the previously presented studies illustrate the complexity of managing natural areas and support the need for further research on visitors’ attitudes to management in natural environments and the inclusion of this aspect in the conceptual model, that is presented in the following.

### **Conceptual Model**

The independent variable in the conceptual model is the construct sensation seeking, due to previous studies supporting the applicability of the personality variable sensation seeking as an explanatory variable of tourism behaviour (Litvin, 2008, p. 442). The definition of sensation seeking was developed by Zuckerman as outlined above and thereby sensation seeking was conceptualized as “a trait defined by the need for varied, novel and complex sensations and experiences and the willingness to take physical and social risks for such experiences” (Zuckerman, 1979, p. 10). The application of sensation seeking as the independent variable is also further discussed in the Method section when examining the conditions for a causal research design. There are several scales to measure the sensation seeking construct, in this study the Brief Sensation Seeking Scale (BSSS) was applied, as is described in the measurement part of the Method section. Table A1 in the Appendix encloses the concrete items for this sensation seeking scale. Consequently, the conceptual model analyses the effects of differences in individuals’ sensation seeking.

Regarding the effects of sensation seeking that were examined, the motives to visit natural areas and the attitudes to management were identified as important in order to understand visitors to natural settings and to contribute to solving the empirical problem

outlined in the introduction. In order to conceptualize these effect categories, findings from previous studies applying the construct sensation seeking in the nature-based tourism context as well as from additional studies on the motives and attitudes to management in natural areas were incorporated. Of particular importance was here the study by Galloway and Lopez (1999), which examined the relationship between sensation seeking and the attitudes to various aspects of national parks, that were chosen from the results of various analyses of motivations for leisure travel behaviour (pp. 665-666). Due to the distinction between the motives for visiting and the attitudes to management in this model, the national park feature categories of “facilities” and “educational” from the Galloway and Lopez (1999) study were assigned to the attitudes to management effect category as their items relating to information, structured tours and facilities can be considered the concern and responsibility of the natural area management (Haukeland et al., 2010, p. 266). Consequently, the motive categories for visiting natural areas derived from Galloway and Lopez (1999) were the following: “social”, including meeting interesting people and spending time with family and friends, “escape/contrast”, which is related to new stimulations and visiting remote places, “physical”, related to pleasant scenery and engaging in activities and “wildlife”, which includes encounters with potentially dangerous animals and actively seeking wildlife (pp. 665-667). In addition, Galloway and Lopez (1999) found “that at least one item of every category was significantly related to sensation seeking” (p. 670), supporting the choice of these subdimensions for the conceptual model.

The choice of these motive categories was also supported by other studies in the context of nature-based tourism presented in the literature review, so did Garms et al. (2017) find in their study of the travel motives of German visitors to a Swedish National Park the following factors: “focus on others”, “nature”, “freedom” and “experiences” and therefore similar motive categories like Galloway and Lopez (1999), but in addition they also identified

the factor “focus on self “ including items related to the opportunity to reflect on life and to find inspiration in natural surroundings (pp. 247-252). Due to the fast-moving society nowadays and its commitments and constraints (Garms et al., 2017, p. 245), this seemed to be an interesting factor to add to the potential motives for visiting natural areas. This is also supported by the finding of Svarstad (2010) that “hiking serves as an outlet for deeper thoughts about aspects of the otherwise hectic life” (p. 99). Scholtz et al. (2013) identified with the motives of “escape”, “socialising & exploration” and “wildlife experience” among other categories (p. 6), and Kim et al. (2003) with the motives of “family togetherness”, “appreciating natural resources and health”, “escaping from everyday routine” and “adventure and building friendship” (p. 174) also similar concepts like Galloway and Lopez (1999) in their study. In addition, the categories derived from Galloway and Lopez (1999) and the “focus on self” motive adopted from Garms et al. (2017) were equivalent to domains derived from a meta-analysis of the item pool of the previously mentioned REP Scale, that measures desired goal states of outdoor recreation, with the domain categories including “family togetherness”, being with “similar people” and “new people”, “enjoy nature”, “introspection” and “escape personal-social pressures” and “escape physical pressure” (Manfredo et al., 1996, pp. 196-204). This correspondence with the domains of the REP Scale supported the choice of the following motive categories for the conceptual model: *Social*, *escape*, *physical*, *wildlife* and *focus on self*. The concrete items defining the motive categories are included in Table A2 in the Appendix.

With regard to the other effect category that was examined in the conceptual model, namely the attitudes to management in natural areas, the national park feature categories “educational” and “facilities” from the Galloway and Lopez (1999) study presented possible subdimensions as mentioned above, whereas “educational” referred to preferences for particular information and structured tours and “facilities” to preferences regarding eating



places and primitive facilities (p. 666). Haukeland et al. (2010) identified in their cluster analysis of Norwegian national park visitors' quests for facilities with "tracks & signposting", referring to the condition of trails like more nature paths or better signposting, and with "tours & interpretation", including guided tours (p. 259), similar categories to the "facilities" and "information" concepts from Galloway and Lopez (1999), considering the items included in both studies in the respective categories.

In addition, Zeidenitz et al. (2007) found that the attitude towards the management intervention measure information predicts the intention to behave ecologically responsibly during outdoor recreation activities, which was also confirmed by an experiment (pp. 182-183, 185), therewith illustrating the importance of this aspect of natural area management. This is also supported by the finding of Denstadli et al. (2010) that indirect management actions like provision of information of how to minimize damage to nature and how to guide visitors to "impact-resistant" areas were the most preferred management action (pp. 367-368). Based on this the attitude to the management of *information* in natural areas was included in the conceptual model. Regarding the facilities in natural areas, Zeidenitz et al. (2007) also conducted an experiment to evaluate the intervention measure infrastructure and found support that infrastructure can further ecologically responsible behaviour (pp. 185-187). Denstadli et al. (2010) analysed the attitudes to the concrete management action of placing boardwalks over marshy areas and found that despite the ecological benefits of boardwalks they were rated less appealing than trails highly impacted from hiking (pp. 366-368). In addition, the aspect regarding signposting identified by Haukeland et al. (2010) seemed to be an interesting aspect of facilities to add as it is one of the few visitor facilities that are permitted in Norwegian national parks (pp. 254, 259), and is thereby also of interest for natural areas. Consequently, the attitude to the management of *facilities* appears to be a

complex issue that should be examined further. Facilities thereby refer to “a place, amenity or piece of equipment provided for a particular purpose” (Lexico, 2020).

Moreover, two of the factors of Arnberger et al.’s (2012) study of attitudes to protected area management, namely “protection of nature” and “guidance of visitors”, were not specific to the examined park and therefore provided possible categories to include in the conceptual model, especially as understanding the attitudes towards natural area management is important for the achievement of an acceptable management policy, as negative attitudes could lead to conflicts over visitor management as previously mentioned (pp. 48, 54). Huang et al. (2008) applied in their study of attitudes to the management of national forest parks in China with the categories of “roles and functions of the parks” and their “policy” also similar categories to the ones of the study by Arnberger et al. (2012), highlighting the important role of protecting nature and the corresponding regulation of recreation in natural areas. This applies not only to protected areas but also to natural areas in general as both are subject to the same negative impacts accompanying tourism as indicated above. In this regard, Denstadli et al. (2010) also examined the attitudes to different regulatory management actions in natural environments, including the regulation of activities, the closing of damaged areas and the charging of fees for the area, which were favoured to different degrees (pp. 367-369). Based on these studies, the attitudes to *protection of nature* and to *regulation of visitors* seem to be important aspects of the management of natural areas and therewith provided useful categories to include in the model in order to be analysed in relation to sensation seeking.

In conclusion, the motive categories included the concepts *social*, *escape*, *physical*, *wildlife* and *focus on self*, whereas the categories of attitudes to management entailed the concepts *information*, *facilities*, *protection of nature* and *regulation of visitors*. Table A2 in the Appendix encloses the concrete items for each of the effect categories, which were adopted from the respective studies with minor adaptations described later on. The

operationalization of the motive and attitude to management concepts is also described in more detail in the following Method section.

Figure 1 depicts the conceptual model with sensation seeking as the independent variable and the motive and attitude to management concepts as the different effect categories. With regard to the hypotheses, significant relationships between the personality construct sensation seeking and each of the above mentioned effects were assumed based on the literature and previous research. More specifically, for the categories derived from the Galloway and Lopez (1999) study, the relationship direction could be predicted (p. 666), even though the prediction of the relationship direction must be considered at the item level due to a recoding of some items that is described in more detail in the measurement part (see Table A2). Whereas for the categories derived from studies on nature-based tourism that did not incorporate the concept sensation seeking, including the motive category *focus on self* as well as the attitude categories *protection of nature* and *regulation of visitors* and two of the items of the *facilities* attitude category, due to the lack of research on these attributes in relation to sensation seeking and the resulting exploratory nature of these aspects, the relationship direction was not predicted. Nevertheless, assumptions were made, as higher sensation seekers are more likely to disobey instructions in a natural area (Galloway, 1998, p. 104), their attitude to regulation is likely to be negative. In addition, higher sensation seekers might also put the fulfilment of their need for varied and novel experiences over the protection of the natural environment, implying that the participation in the conservation of an ecologically valuable area might be more appealing to lower sensation seekers (Lepp & Gibson, 2008, p. 748). Furthermore, it was also assumed that higher sensation seekers oppose more facilities as this would likely reduce the perceived risks associated with the recreation activity performed in the natural area, considering that for example through improved signposting visitor safety can be enhanced (Haukeland et al., 2011, p. 30), and the willingness to take risks for new

experiences is part of the sensation seeking trait (Zuckerman, 1979, pp. 10, 183). These assumptions are reviewed later with the results of the data analysis. Subsequently, the Method section outlines how the conceptual model was tested.

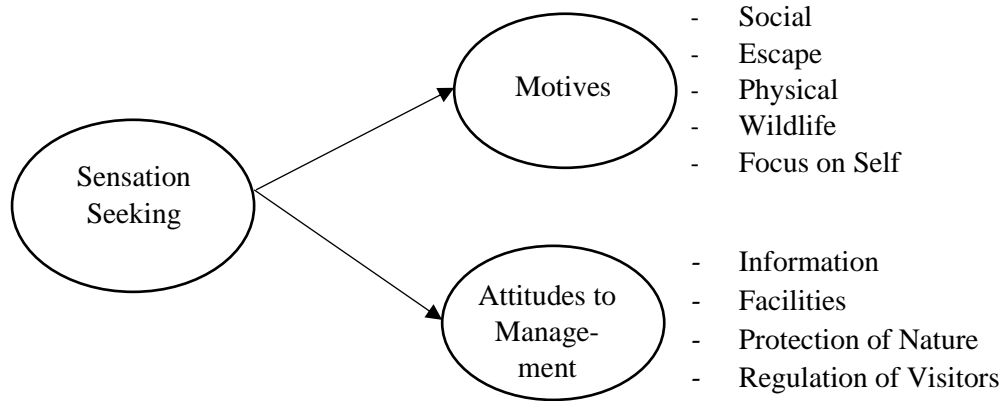


Figure 1. Conceptual Model of the Thesis

**Method**

**Design**

There is already some research on the topic of the thesis available as presented above, which enabled stating hypotheses at the beginning of the research and to create standardized measures before collecting the data, consequently the research design of the thesis was a quantitative design (Neuman, 2014, p. 176). In addition, the conceptual model required to measure many variables and test multiple hypotheses at the same time, therefore a survey in form of a written questionnaire was conducted as it allows by sampling many respondents and asking all of them the same questions to measure several variables and test multiple hypotheses simultaneously (Neuman, 2014, p. 319). More specifically, a self-administered questionnaire was used, for which “respondents answer questions by completing the questionnaire themselves” (Bryman & Bell, 2003, p. 141). As the questionnaires were handed out in person, it was possible to exert some control over the conditions under which the questionnaires were completed in contrast to mail questionnaires (Neuman, 2014, p. 345).

Furthermore, the research questions examined if there is a relationship between sensation seeking and the motives to visit nature areas as well as between sensation seeking and the attitudes to management in natural areas, therewith aiming at explaining differences in these motives and attitudes with the use of a personality variable. Consequently, the research design was also an explanatory research as its purpose was to explain why there are differences in motives and attitudes to management in natural areas and as it built on and tested an existing theory in this regard (Neuman, 2014, p. 40). This focus on the why allowed the relationship to be expressed in terms of causes and effects (Neuman, 2014, p. 74), whereas the personality variable of sensation seeking was the cause and the motives and attitudes the effects of differences in sensation seeking. There are three conditions for causality: temporal order, which was assumed to be fulfilled as sensation seeking is a personality trait with genetic bases (Zuckerman, 1979, pp. 374-379), and therewith comes earlier in time than the effect; association, which was already established through previous research; and no spuriousness, that was achieved by identifying possible alternative causes, namely the control variables, and measuring them (Neuman, 2014, pp. 74-76). Eliminating possible alternative causes of the results ensures that the study has internal validity (Neuman, 2014, p. 221). The inclusion of control variables also allowed to control for sociodemographic differences and therewith for a lack of homogeneity in the sample, considering that a homogenous sample is recommended according to Calder, Phillips and Tybout (1981) as is described in more detail in the next part. It must be noted however, that survey research constitutes a cross-sectional research design, meaning the collection of data at a single point in time, it is therefore not possible to be certain whether a discovered relationship denotes a causal relationship, as the features of an experimental design, namely time ordering and manipulation of variables, are missing (Bryman & Bell, 2003, pp. 48-49). Nevertheless, it is still possible to draw inferences

about causality with cross-sectional research, but the lack of internal validity compared to experimental research must be kept in mind (Bryman & Bell, 2003, p. 49).

Before comparing the effect of sensation seeking with that of the control variables, bivariate relationships, meaning relationships between two variables, were examined, as the relationship between sensation seeking and each of the effect categories was analysed separately (Neuman, 2014, p. 401). Regarding the relationship between the effects themselves, it can be assumed that there is some connection between motives and attitudes, as motives can be conceptualized as values and values are the basis for the construction of attitudes (Galloway & Lopez, 1999, p. 665; Homer & Kahle, 1988, p. 638). Nevertheless, this was not focussed on in the thesis with the emphasis being on testing the relationship between sensation seeking as the explanatory variable and the different effect concepts.

Concretely, the questionnaire consisted of statements with which the respondents had to indicate their agreement or disagreement. As members of the population of interest were directly approached, screening questions, that ensure that respondents are eligible to take part in the study (Neuman, 2014, p. 343), were not necessary with the exception of being over 18 years of age to ensure informed consent as is later described in more detail. Questions measuring the control variables were included in the survey in order to anticipate possible alternative explanations and through examining their effect, rule out alternative explanations as outlined above (Neuman, 2014, pp. 319-320). Control variables are defined as “a third variable that represents an alternative explanation for a two-variable relationship” (Neuman, 2014, p. 416). Possible control variables to be examined in this thesis included age, gender and experience level due to previous research applying these variables as possible influences on motives in outdoor recreation, whereas experience was assessed through self-categorisation as novice, lower intermediate, intermediate or advanced (Pomfret & Bramwell, 2016, pp. 1447, 1463, 1473). Age and Gender were also applied in the studies by Galloway

and Lopez (1999, p. 667) and Galloway (2002, p. 582) as sociodemographic characteristics that were included in the analysis in the context of national parks, therewith supporting the choice of these control variables. Pizam et al. (2004) also incorporated nationality as a possible mitigating factor in the sensation seeking context (p. 254), which was another interesting factor to include, as was also pointed out by Pomfret and Bramwell (2016) in their study of mountaineer tourists (p. 1474).

Regarding the research design, the article by Calder et al. (1981) can be mentioned, in which the authors distinguished between two types of generalizability, namely theory and effects application, and the corresponding different methodological implications (p. 197). This thesis can be assigned to the theory application generalization, as a scientific theory, the sensation seeking theory, was applied to explain events beyond the research setting, namely to understand visitors not only to the nature area near Stavanger where the data collection took place but to natural areas in general (Calder et al., 1981, p. 197). The chosen form of generalization has implications for the research procedure (Calder et al., 1981, p. 199), which is outlined in more detail in the following when the sample and data collection are described.

### **Sample**

Considering the previous outlined aim of the thesis to understand visitors to nature areas, the population that was investigated in the thesis are visitors to natural areas nearby urban areas. By gathering the data at a site that provides a range of experiences that are primarily dependent on nature, a sample of nature-based tourists can be achieved (Mehmetoglu, 2007, p. 652). As the increasing visits to nature areas show that people increasingly spend their time and money to express an interest in natural appreciation (Eagles, 2007, p. 28), a quest for nature experiences seems to characterize visitors to natural areas (Haukeland et al., 2010, p. 248). Therefore, it can be assumed that the population is characterized by some homogeneity with regard to their interests, even though it is likely that

there is a variety of sociodemographic characteristics in the population with nature areas being usually visited by different age groups, education levels and occupations (Galloway, 2002, p. 586; Garms et al., 2017, p. 246; Haukeland et al., 2010, p. 256; Pomfret & Bramwell, 2016, p. 1463). In addition to a variety of sociodemographic characteristics it is also likely that the population is characterized by different degrees of sensation seeking, as natural areas are attractive to both low and high sensation seekers as previously identified. Despite this intention of examining visitors to natural areas in general, the practice of collecting data in Norway, that is described in more detail in the next section, made it more likely to achieve a sample representative of visitors to natural areas in Norway, which has implications on the generalizability of the results as is later discussed. In this regard, it can also be assumed that foreign tourists rather visit specific nature attractions, in particular hotspots that experience significant increases of demand, for example the Besseggen mountain ridge in Jotunheimen National Park in Norway, instead of nearby, natural areas (Haukeland et al., 2011, p. 16), therefore the population is likely to be residents from the area and therewith in this case mainly Norwegian, which contributes to the homogeneity of the sample.

As the thesis tests a theory, namely the utility of sensation seeking in explaining motives and attitudes to management in natural areas, this implies that according to Calder et al. (1981) a representative sample is not required and the research sample does only need to allow a test of theory, which can be provided by any sample in the theory's domain (p. 200), meaning in this case any sample of visitors to natural areas entailing different degrees of sensation seeking. Therefore, a convenience sampling was conducted, which is a non-random sample in which the researcher selects anyone he or she happens to come across (Neuman, 2014, p. 248). This choice of sampling is also supported as a representative sample is not always feasible due to time, cost and other practical limitations (Neuman, 2014, p. 248). In order to avoid that the theoretical relationship is obscured by a variability in behaviour



associated with heterogenous groups, a homogenous sample is preferred, which allows for a stronger test of theory (Calder et al., 1981, p. 200). This corresponds to the previous assessment that the population is relatively homogenous with regard to their interests, even though a variety of sociodemographic characteristics in the population was assumed, for which the control variables were incorporated in the research design as previously outlined. As with sensation seeking a personality trait and therewith an individual difference variable was examined that cannot be manipulated by the researcher, testing the theory required that variability in this trait was achieved by sampling individuals who differed on this dimension of interest (Calder et al., 1981, p. 199). By drawing the sample in a location that offers the opportunity for outdoor recreation activities preferred by high and low sensation seekers, it was ensured that the sample varied regarding this dimension and therewith represented the different sensation seeking scores in the population, which is also described further in the next part.

In addition to the sampling procedure, a decision regarding the sample size was necessary. The sample size depends on “population characteristics, the type of data analysis to be employed, and the degree of confidence in sample accuracy needed for research purposes” (Neuman, 2014, p. 269), but it is also affected by time and cost constraints (Bryman & Bell, 2003, p. 101). Considering, that the conceptual model includes ten different concepts, namely sensation seeking, the five motive categories and the four attitude categories, a sample size of 200 would be appropriate according to Siddiqui (2013, p. 286). As the population is relatively homogenous as mentioned above and as less confidence was required in sample accuracy as is the case in health research, this supported a smaller sample size, whereas the examination of several variables simultaneously, the lack of research on the specific context of the study and therewith lacking information on the strength of the relationships as well as the goal of a precise statistical analysis endorsed a bigger sample (Neuman, 2014, p. 269). In addition,

Tabachnick and Fidell (2013) recommended a formula to calculate the required sample size for multiple regression dependent on the number of independent variables, according to which  $N \geq 50 + 8m$  (where  $m$  is the number of independent variables) cases are needed to test regression, consequently with five independent variables, namely sensation seeking as the explanatory variable and the four control variables, 90 cases are needed (p. 123). Furthermore, since other studies referred to in this thesis, like the one by Galloway and Lopez (1999) calculating the relationship between sensation seeking and different features of national parks, worked with samples of 100 students, this was set as the minimum sample size due to the time constraints of the thesis. Moreover, it was considered that the unpredictability of the weather conditions during the time of data collection might impede reaching a higher sample size. In the following, the data collection is described in more detail.

### **Data Collection**

A local nature area in the Sandnes Kommune, which is close to the city of Stavanger, more specifically reachable by car in around half an hour and by public transport in around an hour (Google), was chosen as the place for data collection. In particular, the data collection took place at the parking spaces of Gramstad and Dale, which are the starting points for several hikes, for example to Dalsnuten, Bjørndalsfjellet and Lifjellet (Sandnes Kommune, 2016, pp. 6-8), and therewith the data collection site offered a range of experiences that were primarily dependent on nature (Mehmetoglu, 2007, p. 652). According to M. K. L. Pedersen (personal communication, March 5, 2020), the manager of the cabin Gramstadtunet near the Gramstad parking place, the number of hikers to Dalsnuten that is recorded by the Stavanger Turistforening through a sensor amounted to 181.813 in 2017, 201.508 in 2018 and 222.065 in 2019, showing a steady increase of visitors to the area and therewith making it a fitting case for the empirical problem of combining increasing visits to nature areas with the protection of the nature as indicated in the introduction. The area offers easier hikes named “lett” and more

challenging hikes called “krevende” (Sandnes Kommune, 2016, pp. 6-8). She et al. (2019) found that sensation seeking is a significant predictor of hiking preference, with hikers scoring higher on the sensation seeking scale being more likely to take the adventurous routes than laid-back hiking routes (pp. 9-10). In addition, there are some climbing opportunities in this area (Stavanger & Ryfylke Regions, 2020), for which sensation seeking was identified as a key influence for participation in this form of outdoor recreation (Pomfret, 2006, p. 118). Consequently, the data collection site offers the opportunity for soft mountaineering activities, which are less physically demanding and demand limited skills as well as for hard mountaineering activities requiring advanced skills and including real risk, for example through the climbing opportunities (Pomfret, 2006, pp. 116, 118), and therefore the location enables the pursuit of outdoor recreation activities preferred by high and low sensation seekers. Regarding the selection of the research setting, Calder et al. (1981) recommended for the theory testing form of generalization, laboratory settings, but the authors also stated that if the theoretical hypotheses involve variables that cannot easily be examined in laboratory settings, as can be assumed to be the case for the motives and attitudes of visitors to natural areas, a test of the theory in not insulated settings is also possible (p. 202), therefore conducting a survey in the field seemed a feasible research setting in accordance with the recommendations by Calder et al. (1981).

Regarding the time of the data collection, a focus was planned on weekends, as in Norway hiking is seen as a family activity, especially on Sundays (Svarstad, 2010, p. 106), and therewith it was assumed that a bigger sample size can be achieved by collecting data on the weekend. Nevertheless, in order to ensure to represent all members of the population in the sample, it was also planned to collect data on weekdays to include all visitors to natural areas. Due to the choice of the convenient sampling procedure, every person encountered at the sites of data collection was approached and asked to fill out the survey and return it once

completed. This way of approaching respondents was similar to the mall-intercept method, in which the interviewer intercepts a sample of those passing by in a shopping mall to ask if they are willing to participate in the study (Rice & Hancock, 2005, p. 2). The mall-intercept approach is very popular in tourism research due to its time and cost efficiency (Litvin & Kar, 2001, p. 309), therewith applying a similar approach for contacting respondents appeared feasible for this thesis.

With regard to approaching respondents, ethical issues also had to be considered, so for example it is important to secure prior voluntary consent when doing research (Neuman, 2014, pp. 147, 151). This was achieved by including informed consent, meaning a written statement in the beginning of the questionnaire that explains the aspects of the study to the respondents and asks for their voluntary agreement to participate (Neuman, 2014, p. 151). The questionnaire with the informed consent is included in the Appendix (see Appendix B). In addition, it is necessary to protect the respondents' privacy, which entails anonymity and confidentiality (Neuman, 2014, p. 154). Anonymity means that participants remain nameless in order to keep their identity unknown (Neuman, 2014, p. 154), and confidentiality refers to the ethical protection of respondents by "not releasing information in a way that permits linking specific individuals to specific responses" (Neuman, 2014, p. 155). As there was only anonymous data collected in this thesis that does not allow to link individual persons with the data and by only presenting aggregated results, anonymity and confidentiality were ensured. In this regard, it can also be mentioned that the project was registered with the Norsk Senter for Forskningsdata (NSD) and was assessed as not including personal data. In order to make sure that respondents commanded complete freedom and awareness to grant voluntary consent, only participants over 18 years were included in the study (Neuman, 2014, p. 151).

In conclusion, possible respondents included all people over 18 years visiting the described local nature area in the Sandnes Kommune near the city of Stavanger at the chosen

dates. It was planned to approach respondents and collect data until a sufficient sample size was reached, namely at least 100 participants but ideally 200 as previously mentioned.

### **Measurements**

The instrument for measuring the concepts of the conceptual model was a questionnaire as already stated. The questionnaire contained various statements that measured the concepts. Regarding the measurement of sensation seeking, there are several scales available. Galloway and Lopez (1999) applied the Sensation Seeking Inventory developed by Arnett (1994), which consists of 20 items and two subscales (p. 667). Nevertheless, except for that study no other tourism-related research utilized that scale according to Litvin (2008) and instead the scale developed by Zuckerman remains the more widely used and accepted scale (p. 441). According to Hoyle, Stephenson, Palmgreen, Lorch and Donohew (2002) the sensation seeking construct is typically assessed using Form V of the Sensation Seeking Scale (SSS-V), comprising of 40 items in forced choice format (p. 402). This SSS-V was developed by Zuckerman, Eyseneck and Eyseneck (1978, pp. 142-145), based on research from over 30 years and was found to have substantial reliability (Litvin, 2008, p. 441). However, there is also critique of this scale, for example related to the large number of items, the forced-choice format and the outdated language (Hoyle et al., 2002, p. 402).

Hoyle et al. (2002) therefore developed an alternative scale, called the Brief Sensation Seeking Scale (BSSS), whereas each of the four dimensions of the SSS-V, namely experience seeking, boredom susceptibility, thrill and adventure seeking and disinhibition, is represented by two items, to which responses are indicated on five-point Likert-type scales (pp. 404-405). In addition to Hoyle et al. (2002) founding confirmation for the reliability and validity of the new scale (pp. 411-412), other studies also applied this short form of the Zuckerman scale and found it to be a reliable, accurate and valid measure of sensation seeking (Lepp & Gibson, 2008, p. 744; She et al., 2019, p. 5). Moreover, shorter scales have the advantage that they

reduce respondent fatigues and boredom as well as frustration and therewith Litvin (2008) suggested that the psychometric costs of the BSSS should be within an acceptable range, especially as a statistical comparison of test scores for the BSSS and SSS-V yielded very positive outcomes for the BSSS (p. 444). Consequently, the BSSS was chosen as the measurement instrument for the personality variable sensation seeking. Table A1 in the Appendix shows the items of the scale, for which the response categories ranged from “strongly disagree” to “strongly agree” in accordance with Hoyle et al. (2002, p. 404).

For the measurement of the effect categories, statements with which the respondents had to indicate their agreement and disagreement were also applied as in previous studies examining motives and attitudes in the context of natural areas (Arnberger et al., 2012, p. 52; Galloway & Lopez, 1999, p. 666). A Likert-type scale was chosen due to being one of the most frequently used formats for measuring attitudes and its simplicity and ease of use (Bryman & Bell, 2003, p. 161; Neuman, 2014, p. 234). Furthermore, five-point Likert-type scales were applied as these scales are perceived by respondents as relatively quick and easy to use, therewith preventing them from becoming frustrated when completing questionnaires in limited time (Preston & Colman, 2000, p. 13). In addition, Preston and Colman (2000) found that reliability and validity indices were higher for scales with five or more response categories (p. 11), thereby supporting the choice of a five-point response scale. Moreover, it corresponded with the response categories of the BSSS and therewith simplified filling out the questionnaire for the respondents (Neuman, 2014, p. 341). Consequently, responses on the motive and attitude to management statements were indicated on five-point Likert-type scales with the response categories ranging from “strongly disagree” to “strongly agree”.

The concrete items for each of the different effect categories are enclosed in Table A2 in the Appendix. The items were adopted from the studies from which the effect categories were chosen, as is described in the conceptual model part, with only minor adaptations related

to the focus on natural areas, for example replacing the word “national park” with “natural area”. Table A2 also includes the respective sources of each of the items. Because the studies are published in scholarly journals they went through a peer review process ensuring high quality (Neuman, 2014, pp. 15, 130), therefore it was assumed that the item wording followed the rules and principles for designing good questionnaire items and was suitable with regard to wording, language and possible biases (Bryman & Bell, 2003, pp. 164-168; Neuman, 2014, pp. 321.-325; Seaton & Bennet, 1996, pp. 98-99). In addition to the benefit of the already examined measurement qualities of existing questionnaire items, they also allow to draw comparisons with previous research findings (Bryman & Bell, 2003, p. 171). Regarding the number of items per construct, it can be stated that motives in reality are often fuzzy (Gnoth, 1997, p. 286), therewith making it a complex construct, but by looking at different subdimensions the construct becomes more concrete (Neuman, 2014, p. 225), and by comparing the motive categories across different studies as it is described in the conceptual model part it was aimed at capturing the width of the construct with regard to natural area tourism. Because the subdimensions then present more narrow concepts than the overall motive concept, they can accurately be represented by fewer items (Hays, Reise & Calderón, 2012, p. 1403). Therefore, each of the different motive categories was indicated by two items, as it was also conducted in the study by Galloway and Lopez (1999, p. 666). Similarly, the attitude to management concept was also categorized in different aspects to reflect its diversity regarding different attitude objects (Gnoth, 1997, p. 286). The attitude to the management of *information* and *protection of nature* was in accordance with the motive categories only indicated by two items, whereas the attitudes to *facilities* and *regulation of visitors* consisted of four items each to capture the width of their aspects and to include the in the conceptual model part indicated specific measures. Moreover, the nature of the data collection, meaning asking respondents outside in the nature area to complete the survey,

supported the choice of fewer items per category in order to reduce the response burden for the participants (Hays et al., 2012, p. 1403). In addition, it must be considered that the items also contained unique preferences for example for specific facilities like boardwalks, which on the one hand meant that for these items an indication through multiple items was not necessary due to these preferences being conceptually quite narrow (Hays et al., 2012, p. 1402), but on the other hand this also implied that even though the items related to an overall concept each of them also had a certain amount of uniqueness and specificity (Churchill, 1979, p. 68).

It was also important to consider measurement error, which is “any deviation from the true value of a variable that arises in the measurement process” (Asher, 1974, pp. 467-470). This measurement error can be random or non-random (Asher, 1974, p. 470). With regard to random error, it is possible to cancel this measurement error out through multiple items (Churchill, 1979, p. 66). Although in this thesis several multiple indicators were only applied for sensation seeking, as the effect categories consisted only of two to four items, which also contained some unique preferences as indicated above, making an examination of the reliability and validity of the effect categories necessary in order to decide about the aggregation of these items to overall concepts, which is examined further in the Results section. Nonrandom error, also called systematic error, however includes common method bias, that is defined as “the biasing effects that measuring two or more constructs with the same method may have on estimates of the relationships between them” (Podsakoff, MacKenzie and Podsakoff, 2012, pp. 540, 542). Because the explanatory variable sensation seeking as well as the effect concepts were examined with the same questionnaire, this constituted a possible source of bias. Podsakoff et al. (2012) presented several procedural remedies to control for the different sources of method bias (p. 548). For this thesis, the balancing of positive worded items, where agreement with the item indicates a higher score



on the underlying construct, and negatively worded items, where agreement indicates a lower score, was applied to reduce common method bias (Podsakoff et al., 2012, p. 552). A proximal separation of indicators of the same constructs in the questionnaire recommended by Podsakoff et al. (2012) was not conducted to avoid additional response burden for the respondents (pp. 549-550). Due to the application of existing questionnaire items, it was furthermore assumed that the scale items were reviewed to eliminate ambiguity and reduce social desirability bias (Podsakoff et al., 2012, pp. 551-552). As the sensation seeking scale consists of more sensitive items, it was put to the end of the questionnaire as recommended by Seaton and Bennet (1996, p. 100).

Furthermore, a pilot test was conducted to detect possible flaws that would affect the data analysis (Seaton & Bennet, 1996, p. 101). For a pilot test “a small set of respondents who are comparable to members of the population from which the sample for the full study will be taken” (Bryman & Bell, 2003, p. 170), is recommended. Therefore, the pilot test was conducted in a natural area near Stavanger, but a different one than the place of the actual data collection to avoid carrying out the pilot test on potential members of the sample employed in the full study (Bryman & Bell, 2003, p. 170). More specifically, the tower Ullandshaugtårnet was chosen due to its popularity for walks and easy accessibility (Visit Norway, 2020). The pilot test was conducted on Sunday, the 23.02.2020 with five people, whereas everyone the researcher happened to come across was asked to participate, while simultaneously also following the aim to maximize the variance in the pilot study sample to correspond to the variety of the sociodemographic characteristics outlined in the description of the population, and by including different nationalities, gender and experience levels and some variation in the higher age range a varied sample was achieved. According to Boyd, Westfall and Stasch (1977) “the first series of pretests should be conducted by personal interview” (as cited in Hunt, Sparkman & Wilcox, 1982, p. 270), whereby pretesting refers to the use of the

questionnaire in a small pilot study to examine how well the questionnaire works (Hunt et al., 1982, p. 269). Personal interviews enable the researcher to notice reactions and other cues by the respondents (Hunt et al., 1982, p. 270). In this case the debriefing method was applied, in which the respondent is asked to fill out the questionnaire while he is observed by the interviewer and after completion he is probed for potential problems with the format and questions of the questionnaire (Hunt et al., 1982, p. 270). Specifically, the respondents were asked for feedback on the length and layout of the questionnaire, the format and sequencing of the questions as well as their understanding of the questions, related to possible ambiguous and confusing questions and unfamiliar terminology (Hunt et al., 1982, pp. 269-270). This was especially important considering that the questionnaire was in English, whereas most of the respondents were assumed to be Norwegian as previously mentioned.

In general, the questionnaire was assessed as being easily understandable with only specific words that some respondents were not familiar with and for which definitions were added to the questionnaire. As it was not apparent for some respondents if the questionnaire related to the specific nature area where the data collection took place or to natural areas in general, a corresponding information was added to the information letter of the survey. Moreover, the respondents showed interest in the reasons for the study referring to own observations of how increasing visits disturb nature, nevertheless it was refrained from mentioning the empirical problem that motivated the thesis, namely how to combine tourism and conservation in natural areas in a sustainable way, in the information letter of the survey to avoid demand characteristics, meaning that the research participants modify their behaviour, in this case their responses, to what they think the research demands of them (Neuman, 2014, pp. 302-303). In addition, hunting was mentioned in the context of the wildlife motive as an important aspect, nevertheless as the items were formulated in a general way so that they could potentially refer to hunting, they were not reformulated in order to

allow comparisons with the study by Galloway and Lopez (1999), from which the items were derived. Furthermore, it was examined if some questions were answered by all respondents in the same way or if some questions were not answered at all (Bryman & Bell, 2003, p. 170), with the result that the respondents answered all the questions and responses to the statements differed among them, which supported the prospects of a well-functioning research instrument (Bryman & Bell, 2003, p. 170). In addition, by applying questionnaire items from other studies, these were in a sense already piloted by other researchers (Bryman & Bell, 2003, p. 171). Therefore, it was also refrained to do an expert study, which means that “people who have theoretical questionnaire knowledge or practical experience are asked to review draft questionnaires with an eye to identifying questionnaire problems” (Demaio & Landreth, 2004, p. 60). In the following, the planned data analysis to conduct with the final collected data is described.

### **Planned Data Analysis**

Before the actual data analysis, it was planned to describe the achieved sample and the collected data in general and then to examine the quality and validity of the data. In the actual data analysis then, first the sensation seeking scores of the sample were intended to be analysed with regard to the sociodemographic characteristics. Subsequently, it was planned to examine bivariate relationships, meaning to calculate the relationship between sensation seeking and each of the effects separately. For this, bivariate statistics, statistical measures that involve only two variables, can be applied (Neuman, 2014, p. 403). Possible bivariate statistics are measures of association that condense the information about a bivariate relationship into a single number and express the strength and the direction of a relationship (Neuman, 2014, p. 412). Techniques to explore the association between pairs of variables, also called correlation, are often used by researchers in non-experimental research designs (Pallant, 2010, p. 121). Before performing the correlation analysis, it is recommended to

generate a scatterplot to verify that the assumptions for the techniques are fulfilled, specifically the linearity of the relationship and homoscedasticity (Pallant, 2010, pp. 125-126, 129). Even though five-point Likert-type scales were applied, which are strictly speaking ordinal (Norman, 2010, p. 625), the level of measurement was treated to be interval due to the scale properties in the questionnaire (see Appendix B), meaning according to Neuman (2014) a “level of measurement that identifies differences among variable attributes, ranks categories, and measures distance between categories but has no true zero” (p. 223). Specifically, the scale was provided with numbers for each response category and the numbers were equally distant, so if these numbers are reasonably distributed it is possible to make inferences about them (Norman, 2010, p. 629). This form of a Likert-type scale with numerical descriptors, where the respondents select a number to denote their level of agreement with the item (Dawes, 2008, p. 62), also signalled the respondent a metric scale considering that “numbers have the objective characteristic that indirectly implies independence and non-biasness” (Yusoff & Mohd Janor, 2014, p. 2).

The chosen measure for the association between sensation seeking and the effect categories, as both were consequently measured at the interval level, was the Pearson product-moment correlation coefficient ( $r$ ) (Bryman & Bell, 2003, p. 244; Pallant, 2010, p. 128). Furthermore, the Pearson correlation coefficient is “the most commonly used measure of correlation” (Neuman, 2014, p. 415). In addition, the Pearson correlation coefficient seems insensitive to violations of its basic assumptions, including regarding the type of scale and resulting skewness and nonnormality (Norman, 2010, pp. 629-630), providing support for treating the Likert-type scale as an interval scale. Consequently, it was planned to calculate the Pearson correlation coefficient between the sensation seeking score and the extent of agreement with each of the motive and attitude to natural area management concepts, whereas the aggregation of the items to the motive and attitude categories depended on the

analysis of the reliability and validity of the measures when examining the quality of the data that preceded the actual data analysis. This was conducted with the IBM SPSS Statistics Software 25. The SPSS program also allows next to calculating correlations to examine if they are statistically significant, indicating the degree of confidence in the obtained results (Pallant, 2010, p. 135).

Furthermore, it was planned to conduct first standard regressions with sensation seeking only and subsequently multiple regressions for the motives and attitudes to management, whereby multiple regressions have the advantage to adjust for several variables simultaneously while indicating the direction and size of the effect of each variable on a dependent variable (Neuman, 2014, p. 421). Therefore, multiple regressions enable to compare the effect of sensation seeking with those of the control variables. Multiple regression is based on correlations, but it offers “a more sophisticated exploration of the interrelationships among a set of variables” (Pallant, 2010, p. 148). The correlation analysis therefore aimed at answering the Research Questions 1a and 2a, meaning if there are significant relationships between sensation seeking and the motives and attitudes to management, whereas the regression analysis was intended to answer the Research Questions 1b and 2b, namely if sensation seeking can explain a significant amount of variance in the motives for visiting natural areas and the attitudes to management. In order to examine how well sensation seeking predicts the extent of agreement with the different motive and attitude to management concepts after the effect of the control variables is controlled for, hierarchical multiple regressions were planned to conduct (Pallant, 2010, p. 149). As with correlation, also regression is robust to violations of its assumptions and can therefore be conducted with the data from Likert-type scales (Norman, 2010, pp. 627-628). Multiple regression can also be conducted with dichotomized variables and is therewith also possible with categorical variables like gender and nationality (Pallant, 2010, p. 153), which is discussed further in the

Results section. Before presenting the results of the data analysis, the actual data collection and the obtained sample are briefly presented in the following.

### **Actual Data Collection and Sample**

The actual data collection took place on ten days in the time period from the 26.02.2020 to the 08.03.2020 with a total of approximately 23 hours of collecting data. Regarding the conduction of the data collection, the weather turned out to be a bit problematic, as storm, rain and cold temperatures on the one hand shortened the time for the researcher to stay outside and collect data and on the other hand made the completion of the questionnaires for the respondents more challenging. In addition, initially a focus of the data collection on weekends, especially on Sundays, was planned due to hiking in Norway being seen as a family activity, especially on Sundays (Svarstad, 2010, p. 106), but because of unfavourable weather conditions each weekend in the time period of data collection, only little data was collected on the weekend and a majority of questionnaires were filled out on weekdays, which had more favourable weather conditions. Nevertheless, as part of the data collection overlapped with the school winter holidays (Public Holidays Global, 2020), there might be some similarity to collecting data on weekends. Due to the spread of the Corona virus in Norway and the resulting measures an extension of the data collection was also not possible (Helsenorge, 2020).

Furthermore, despite these problems encountered during data collection which led to a non-achievement of the recommended sample size of 200 based on the conceptual model in accordance with Siddiqui (2013, p. 286), still a sample size over the minimum of 100 was achieved. In total approximately 210 people were approached, from who 161 agreed to participate, yielding a cooperation rate of 76.67%, which is the “percentage of contacted, eligible respondents who agree to participate” (Neuman, 2014, p. 342). Two respondents aborted filling out the questionnaire, so that 159 questionnaires were completed and the

“percentage of cooperating respondents who complete the survey” (Neuman, 2014, p. 342), meaning the completion rate, amounted to 98.76%. Therefore, the response rate was calculated as 75.71%, which is a satisfactory result considering that for face-to-face surveys it is difficult to achieve response rates over 70% (Brehm, 1993, as cited in Krosnick, 1999, p. 539). Nevertheless, when entering the questionnaire responses in SPSS, it was recognized that eight questionnaires contained missing data. In accordance with Neuman (2014, p. 229) and Pallant (2010, p. 58) it was decided to exclude all cases with any missing data to simplify the data analysis and as the excluded cases differed with regard to the unanswered items and the sociodemographic characteristics the generalizability of the findings should not be limited by this (Neuman, 2014, p. 229). As a consequence, responses from 151 participants were used for further analysis, which is presented in detail in the next part.

## **Results**

### **Description of the Achieved Sample**

First the achieved sample is described in relation to the various sociodemographic characteristics that were asked for in the questionnaire. With regard to gender, it can be stated that 82 of the respondents were female, 68 male and one participant chose the “other” option, therewith the sample consisted of 54.30% males and 45.03% females, showing that gender was distributed quite equally in the sample. The average age was reported to be 40.58, which is below the mean age of 49 years, Garms et al. (2017) identified in their study of visitors to a Swedish national park (p. 247), and below the average age for males and above the average age for females found by Galloway (2002) in his study of visitors to parks in Canada (p. 582). In addition, the minimum age was 19 and the maximum age 76 and the standard deviation was calculated with 15.25 years, showing that there is considerable variation of age in the sample as it exceeds the standard deviations for age of both females and males found by Galloway (2002, p. 582). Moreover, the sample consisted of 114 Norwegians, accounting for

75.50% of the sample and therewith corresponding to the previously stated assumption that the sample will be mainly Norwegian, next to six respondents with Polish nationality and three respondents each with British, Danish, Filipino and German nationality. Additionally, the sample included two respondents from France, Serbia, South Korea, Spain and the United States and one respondent each from Brazil, Eritrea, Italy, Lithuania, Malawi, Romania, Sweden, Switzerland and Tunisia and therewith showing a broad range of different nationalities, even though they were only presented to a very small extent in the sample. Furthermore, regarding the experience level, 2.65% categorized themselves as novices, 27.15% as lower intermediates, 47.68% as intermediates and 22.52% as advanced, implying a majority of respondents indicating that they perceive themselves on the intermediate level with regard to the practiced outdoor activity. This corresponds to the finding of Pomfret and Bramwell (2016) who found that 46% of their respondents categorized themselves as intermediate (p. 1463). However, in the sample of the study by Pomfret and Bramwell (2016) only 11% perceived themselves as advanced (p. 1463), whereas in this sample the percentage was nearly double. Nevertheless, it must be kept in mind that in the questionnaire of this thesis it was asked for experience with any outdoor activity possible in the natural area, which therefore possibly also referred to more “soft” mountaineering activities (Pomfret, 2006, p. 118), than those performed by the mountaineer tourists in the study by Pomfret and Bramwell (2016, pp. 1460-1462).

### **Description of the Collected Data**

Secondly, the collected data is described with regard to basic descriptive statistics. Table C1 in the Appendix entails for each of the items of the questionnaire the four moments of distribution, which includes the mean as the measure of central tendency, the standard deviation as a measure of variability, skewness which measures departure from symmetry and kurtosis that represents deviations from the normal curve (Hopkins & Weeks, 1990, pp. 717-



718). Therewith, skewness and kurtosis were obtained to assess the normality of the data, which is a requirement of many statistical techniques (Pallant, 2010, p. 59). For a perfectly normal distribution, the skewness and kurtosis value would be zero (Pallant, 2010, p. 57). For the collected data skewness varied from -1.87 as the lowest to 1.16 as the highest value among all items of the questionnaire, whereas eight items had values below -1.0 or above 1.0, even though when rounding to zero decimal places only three items were out of range (see Table C1). Regarding the kurtosis, the values varied from -1.30 to 4.13 and of all items 10 were out of the range -1.0 to +1.0, however when rounded to zero decimal places only three items were out of the range (see Table C1), and therefore, most variables had univariate skewnesses and kurtoses in the range -1.0 to +1.0 or close to it, so that not too much distortion was expected (Muthén & Kaplan, 1985, p. 187). The three items with skewnesses and kurtoses out of the range, even when rounded to zero decimal places, had negative skewness values, which indicate that the scores cluster on the high end of the graph, and positive kurtosis values indicating a peaked distribution (Pallant, 2010, p. 57; see Table C1). This was important to determine before starting the actual data analysis that was conducted after examining the quality of the data, which is described in the next paragraph. In addition, Table C1 includes the abbreviations for the items that are used in following tables for easier readability. Furthermore, the descriptive information of the items is also referred to when complementing possible interpretations of the results.

### **Examination of the Quality of the Collected Data**

**Reliability analysis.** In order to examine the quality of the data, reliability and validity were investigated. Measurement reliability thereby refers to the consistency of the measure, meaning that the results do not vary because of the measurement instrument itself (Neuman, 2014, p. 212). One of the main issues in this regard is internal consistency, referring to the degree to which the items of a scale are all measuring the same underlying construct, which is

commonly indicated by Cronbach's alpha coefficient (Pallant, 2010, pp. 6, 97). For the BSSS measuring the sensation seeking construct, the Cronbach's alpha coefficient amounted to .73. According to DeVellis (2012) Cronbach's alpha of a scale should be above .65 and can be considered respectable above .70 (p. 109), therewith the Cronbach's alpha coefficient of the BSSS suggested good internal consistency reliability for the scale. Table D1 includes more information on the output of the SPSS reliability analysis for the BSSS, that provides further support for the good reliability of the BSSS, for example the alpha if item deleted values were lower than the final alpha value, therewith suggesting that no items needed to be removed from the scale (Pallant, 2010, p. 100).

As Cronbach's alpha is sensitive to the number of items, and the effect categories only consisted of two to four items, which in addition also contained some uniqueness as previously outlined, for these items the mean inter-item correlations were examined to assess the reliability of the scales in accordance with Pallant (2010, p. 97). Table D2 in the Appendix includes for each motive and attitude to management construct the mean inter-item correlation. In this regard, three items were recoded so that for all items of one category a higher extent of agreement with the statement indicated a higher agreement with the underlying construct. Specifically, the *wildlife* item of avoiding potentially dangerous animals was recoded so that higher agreement with the statement corresponded with higher importance of the wildlife motive, the *information* item of no particular preferences about information was also recoded in order that higher extent of agreement with the statement indicated a higher importance of the management of information and thirdly the *facilities* item of preference for eating in untouched areas was recoded so that for all items of the facilities category, higher agreement with the statements went along with higher importance of facilities in natural areas. According to Briggs and Cheek (1986) the optimal range for the mean inter-item correlation is .2 to .4, as for a score lower than .1 it is unlikely that a single

total score can adequately represent the complexity of the items and for a score higher than .5 the items on the scale are overly redundant (p. 115). For the motive concept *social* and the attitude to management concept *regulation of visitors*, the mean inter-item correlations fell in the optimal range, suggesting good reliability of these scales (see Table D2). The mean inter-item correlations of the motive categories *wildlife* and *focus on self* and of the attitude to management category *facilities* fell in the acceptable range, indicating sufficient reliability, whereas for the motive concept *physical* the score was lower than .1 (see Table D2), suggesting that the items might contain too unique aspects to consider them in one concept, which was further analysed when examining the validity of the data.

For the motive category *escape*, the mean inter-item correlation consisted of a negative value (see Table D2), indicating that for the respondents the items did not measure the same underlying construct. This might imply that the assumption of Galloway and Lopez (1999), from which the items were derived, that for visitors of natural areas escape is achieved by visiting settings that offer new stimulation and activities and that are remote might not hold true for the sample of this study, for which a higher likelihood of revisiting natural areas that offer nothing new went along with lower reluctance to visit remote areas, therewith indicating that for them remoteness and new stimulation and activities were not positively associated in one motive category, possibly requiring a revision of the conceptual definition of the motive *escape*. In addition to the poor conceptualization, the measure could be underdeveloped or the different contexts of the studies could make a difference, with the Galloway and Lopez (1999) study being conducted with students in the U.S., whereas this thesis examined visitors to a nearby, natural area in Norway, which is discussed later in more detail.

For the attitude to management category *information*, the mean inter-item correlation coefficient was also negative (see Table D2), this might indicate next to a uniqueness of the

items and a poorly developed measure, that guided tours were not seen by the respondents as a possible way to receive information about an area, even though this remains speculative and would require further assessment that goes beyond the scope of this study as is outlined in more detail in the Discussion part. The negative mean inter-item correlation coefficient for the attitude to management construct *protection of nature* (see Table D2), might also point to some issues with regard to the understanding by the respondents, meaning that some of the participants might not be aware of the negative aspects of off-trail hiking, which might be the reason why for them the two *protection of nature* items did not indicate the same construct and the scores on the two items were negatively associated, which is also examined in more detail in the next part. As a consequence of this examination of the reliability of the scales, it can be stated that whereas the BSSS enacted sufficient reliability to examine the overall sensation seeking score, for only two effect categories the mean inter-item correlation fell in the optimal range and four of the motive and attitude to management constructs showed low internal consistency, therefore further examination of the quality of the data was necessary to decide about the analysis level, which is presented subsequently.

**Validity analysis.** In the following, the results of examining the validity of the data are presented, which refers to the truthfulness of the measures, meaning the degree to which the measures measure what they are supposed to and therewith fit what actually happens in the real world (Neuman, 2014, p. 212; Pallant, 2010, p. 7). There are different types of validity including face validity, which refers to whether “an indicator ‘makes sense’ as a measure of a construct in the judgement of others” (Neuman, 2014, p. 216). The BSSS was already assessed by previous studies as a valid measure of sensation seeking as presented in the Method section and the items for the motive and attitude to management concepts were also obtained from previous published studies. Through this integration into existing research published in peer-reviewed journals, it was assumed that the measures have face validity

(Neuman, 2014, p. 216), although due to combining items of different studies for the motives and attitudes to management the face validity for these measures was lower than for the BSSS that was tested in this form already in several other studies. In addition, considering that the motive categories were derived from Galloway and Lopez (1999) and only the *focus on self* category was added from another study, the face validity of this measure was likely to be higher than for the attitudes to management, for which items of more studies were combined. Nevertheless, the questionnaire was also pretested to ensure a measurement instrument that also makes sense to the respondents and which did not reveal any major misunderstandings. It is however in this regard necessary to mention the negatively worded items, for which agreement with the statement corresponded with a lower score on the item and which were applied to reduce common method bias (Podsakoff et al., 2012, p. 552), but which might have introduced error in the measure as it might have produced guessing by the respondents (Churchill, 1979, pp. 69-70). This had to be kept in mind when conducting the actual data analysis for these items.

Furthermore, content validity, which means that a measure represents all aspects of a construct, was examined (Neuman, 2014, p. 216). Through the subdivision of sensation seeking in the four different subscales that were also part of the original scale by Zuckerman (1979) as indicated above (Hoyle et al., 2002, pp. 404-405), and by examining different motives and aspects of natural area management through adding findings from other studies in the natural area tourism context to those obtained from Galloway and Lopez (1999), it was aimed at measuring all aspects of the constructs and therewith achieving content validity. However, due to the complexity of concepts like motives and attitudes that was mentioned in the measurement part, it cannot be guaranteed that all aspects of the constructs were captured.

In addition, convergent and discriminant validity were important to consider, which were examined by investigating the relationship of a construct with related and unrelated

constructs (Pallant, 2010, p. 7). In order to analyse convergent and discriminant validity, correlation matrices with all items were computed, unfortunately the correlation matrix with all items was too big for an adequate presentation, which is why it was split in three parts (see Table D3, Table D4 and Table D5). For the measure to have convergent validity, the correlation between items of the same construct should be high, and to have discriminant validity, the correlation of items within the same construct should be higher than the correlation between items of different constructs (Churchill, 1979, p. 70; Neuman, 2014, p. 218). For the following motive and attitude to management categories the correlations between the items of the same construct were high, more specifically statistically significant, providing evidence for convergent validity: *Social, focus on self* and *regulation of visitors*, although for the last item of the latter category the correlations were not statistically significant but still positive (see Table D3, Table D4). Whereas for the motive concept *escape* and the attitude to management concepts *information* and *protection of nature* the correlations between the items were negative (see Table D3, Table D4), corresponding with the findings of the reliability analysis of these scales. For the attitude to natural area management category *facilities*, with one item being recoded, some items were positively correlated and some negative and regarding the motive categories *physical* and *wildlife*, whereby one item was also recoded, items were positively correlated but not statistically significant (see Table D3, Table D4). For all items of the BSSS, correlations between the items were also positive and for the items of the same subscales statistically significant, therewith indicating convergent validity (see Table D5).

Furthermore, for the following motive and attitude to management categories the correlations between items of the same construct were higher than with items of different constructs, evidencing discriminant validity: *Social, focus on self* and *regulation of visitors* with the exception of the last item of the latter construct related to charging fees (see Table

D3, Table D4). Although, it must be mentioned that the resulting good reliability and validity for the *social* concept surprised considering that the relationship between sensation seeking and meeting interesting people was predicted to be positive whereas the relationship with spending time with friends and family was predicted to be negative (Galloway & Lopez, 1999, p. 666), which would have led to the assumption of a lower reliability and validity of this concept, even though the correlation analysis between the *social* items and sensation seeking also contradicted the predicted relationship direction for one of the items as is later shown. For the other effect categories, correlations between items of one construct with some of the items of other categories were higher than within the construct, therewith those constructs lacked discriminant validity (see Table D3, Table D4). For the BSSS it was found that the correlations of items of that scale with items of different constructs were partly higher than within the construct (see Table D5), but considering that sensation seeking was the explanatory variable, high correlations with items of the effect categories should not restrict the quality of the data with regard to the further actual data analysis, because when the constructs are related the measures should also be associated (Neuman, 2014, p. 218). Furthermore, for the subscales of the BSSS the correlations between items of the same subscale were higher than the correlations with other items with the exception of the Boredom Susceptibility subscale (see Table D5).

In addition to assessing convergent and discriminant validity, nomological validity was considered to further examine the validity of the measures, which refers to the degree to which predictions from theory are confirmed and which is ascertained through examining if patterns of association among the empirical measures correspond to those predicted by theory (Calder, Phillips & Tybout, 1983, p. 113). Therefore, it was necessary to examine the correlations between sensation seeking and the effect categories. This was analysed in more detail in the actual data analysis presented in the next part, but a preliminary analysis of the

correlation matrix already showed that there were statistically significant correlations between the sensation seeking items and the items of the motive and attitude to management categories, indicating a certain degree of nomological validity (see Table D5).

Next to examining the correlation matrices, factor analyses were conducted in order to assess the validity of the data (Goodwin, 1999, p. 86). For the subscales of the BSSS and the categories of the motives, a confirmatory factor analysis was performed, as this form of factor analysis is used when it is possible to make hypotheses about the underlying structure of the data, namely the number and nature of the factors, based on theoretical notions or previous research (Goodwin, 1999, pp. 89-90), which was the case for these concepts due to the derivation from previous research as outlined in the conceptual model part. In a confirmatory factor analysis “the data are compared to a proposed measurement model, goodness of fit is assessed, and an acceptable fit is a prerequisite for validity” (Levine, 2005, p. 336). Table D6, Table D7 and Table D8 in the Appendix include the results of the confirmatory factor analyses for the motive categories and the BSSS. The factor analyses were conducted according to the proposed procedure from Pallant (2010), applying Principal components analysis (PCA) as the extraction method and Oblimin rotation (pp. 185-201), whereby a fixed number of factors was selected based on the identified number of subdimensions according to the conceptual model. Oblimin rotation belongs to the approaches to rotation that result in oblique, meaning correlated, factor solutions, which was chosen in order to avoid to incorrectly assume that the underlying constructs are independent (Pallant, 2010, p. 185; Tabachnick & Fidell, 2013, p. 642). For the motive categories, the five factor solution explained a total of 64.94% of the variance and the *focus on self* items loaded strongly on the first component with factor loadings of .84 and .82 and the *social* items on the second component of the factor analysis with factor loadings of .86 and .69, whereas for the other items loadings on the components of the factor analysis in correspondence with the



conceptual model were not identified, reflecting the previous findings with regard to the reliability and validity of these motive constructs (see Table D6). For the BSSS, the four factor solution explained 74.27% of the variance and the components derived from the factor analysis corresponded with the identified subscales (see Table D7), indicating a good fit between proposed model and data and therewith providing evidence for the validity of the measure (Levine, 2005, p. 336). In addition, a confirmatory factor analysis for the BSSS with just a single factor was conducted in correspondence with Hoyle et al. (2002, pp. 408-409), who introduced the BSSS, and it was found that all items were well integrated into the factor with factor loadings ranging from .37 as minimum and .80 as maximum value and an explained variance of 35.31% (see Table D8), providing support for the unidimensionality of the scale, meaning that all indicators indicate a single construct (Neuman, 2014, p. 225), namely sensation seeking. This, next to the previous results showing good reliability and validity of the BSSS, supported the aggregation of the items of the BSSS and the calculation of an overall sensation seeking score. Furthermore, previous studies also found the BSSS to be a stronger measure of overall sensation seeking than a measure of the subtraits, which is why Litvin (2008) recommended that if the subtraits are the focus of the research the full SSS-V scale should be applied (p. 444), thereby providing further support for examining the overall sensation seeking score in this thesis.

As for the concepts of the attitudes to management several items from various previous studies were combined, the development of the measure was not advanced enough to expect a systematic structure and therefore an explorative factor analysis was applied, which is used to gather information about the interrelationships among a set of variables when there is not much research on this measure available yet (Pallant, 2010, p. 181). In addition, due to the medium model fit for the motive constructs and the resulting lack of confirmation of the expected structure, an explorative factor analysis was also conducted for these constructs. It

was also aimed at evaluating the resulting factors with regard to the alignment of the items to new constructs in case these would be meaningful in terms of their content, implying that the new constructs would have sufficient face validity to apply them for further analysis. The factor analyses were conducted according to the proposed procedure from Pallant (2010), applying PCA as the extraction method with Oblimin rotation, and for determining the number of factors, Kaiser's criterion, which says that only factors with eigenvalue of 1.0 or above are retained, and an examination of the scree plots were administered (pp. 183-194). For the motives, the PCA revealed the presence of four components with eigenvalues exceeding one, explaining 18.59%, 13.88%, 11.95% and 10.74% of the variance respectively, even though the scree plot did not show a clear break between the fourth and fifth component and did not indicate a significant change in the shape of the plot at all (see Figure D1, Table D9). Table D9 includes the rotated four factor solution for the motives that explains a total of 55.16% of the variance and shows that in correspondence with the confirmatory factor analysis the *focus on self* items loaded strongly on the first component and the *social* items on the second component and that the *physical* and *escape* items together with a *wildlife* item each loaded on the third and fourth component. Considering the cross loadings of the items on several components, a meaningful combination of the items into new constructs seemed speculative, therewith it was refrained from aligning the motive items into new categories for the actual analysis (DeVellis, 2012, p. 147; see Table D9). As the communalities for all motive items were above .3, it was also refrained from removing items from the scale (Pallant, 2010, p. 198; see Table D9). With regard to the attitude to natural area management items, the PCA revealed the presence of five components with eigenvalues exceeding one, explaining 21.41%, 13.14%, 10.10%, 9.46% and 8.65% of the variance respectively, although the scree plot again did not indicate a significant change in the shape of the plot at all (see Figure D2, Table D10). Table D10 includes the rotated five factor solution for the attitudes to

management, explaining 62.75% of the variance in total and showing that the communalities for all attitude to management items were above .3, therewith not indicating to remove an item from the measure (Pallant, 2010, p. 198). Nevertheless, due to the various cross loadings and the loadings of items of several different categories on one component, a meaningful combination of items into new categories did not seem applicable and instead there might be other reasons like poor conceptualization as well as measurement qualities and contextual factors for the resulting factors, supporting the recommendation of an analysis on the item level for the motives and attitudes for the actual analysis based on the reliability assessment and the previous validity examinations and suggesting the need for a revision of the measures in case of a replication (DeVellis, 2012, p. 147; Goodwin, 1999, p. 94; see Table D10). Consequently, the factor analyses revealed that the data does not fit the conceptual model for the attitude to management concepts and only exhibits a medium fit for the motive concepts, indicating that the concepts and measures selected for the study are either not developed well enough or are not adapted to the present context sufficiently, and that further development of the concepts and measures is needed, which is described in more detail in the Discussion part.

In conclusion of the examination of the quality of the data, it was decided for the actual data analysis to calculate the overall sensation seeking score due to good reliability and validity of the BSSS as examined above, but regarding the effects an analysis on the item level was recommended because of the low reliability and validity for most of the motive and attitude to management measures, especially for the constructs *escape*, *information* and *protection of nature*. The previous examination also indicated that the division into the categories according to the conceptual model did not fit the data and therewith the previous planned aggregation of items to subdimensions was not applicable, showing that the concepts in addition to the measures of the conceptual model for the motives and attitudes to management might be underdeveloped, which is further examined in the Discussion part.

Although there are shortcomings of conducting analysis on the item level (Churchill, 1979, p. 66), the assessment of the degree of reliability and validity made this necessary. Exceptions were the motive constructs *social* and *focus on self* and the attitude to management construct *regulation of visitors* exempt for the last item, which exhibited good reliability and validity, nevertheless in order to unify the analysis, also for these concepts an analysis on the item level was conducted. Furthermore, the unique aspects of the items pointed out earlier and the conduction of the analysis on the item level in other studies examining sensation seeking in the context of nature-based tourism like the study by Galloway and Lopez (1999), provided support for the relevance of results from an analysis of the theoretical model on the item level for the motives and attitudes to management, even though it is necessary to exhibit caution when interpreting the findings. The following chapter presents the results of the actual data analysis.

### **Data Analysis**

**Assumptions of the analysis techniques.** Before conducting the data analysis, it was necessary to examine the fulfilment of the assumptions for the analysis techniques proposed above in the Method part, namely for correlation and regression (Pallant, 2010, pp. 125-126). This included the assumption that scores on each variable should be normally distributed (Pallant, 2010, p. 126). In this regard, the skewness and kurtosis of the data were examined and it was found that most items had skewnesses and kurtoses in the acceptable range or close to it as described above and therewith this assumption should be fulfilled. Further assumptions are that of linearity and homoscedasticity, which refer to the relationship between two variables and had therefore to be examined when the bivariate relationships were identified (Pallant, 2010, p. 126). Nevertheless, as correlation and regression are quite robust regarding violations of these assumptions, the consequences of not fulfilling these

assumptions on the results should not be too severe (Bohrnstedt & Carter, 1971, p. 142; Norman, 2010, p. 625).

**Sensation seeking in the achieved sample.** As the BSSS was assessed to have good reliability and validity, the total sensation seeking score for each individual was computed, which was, in accordance with previous studies applying the BSSS, calculated as the sum of the scores on the items of the subscales (Litvin, 2008, p. 443; Pizam et al., 2001, p. 26), therewith ranging potentially from 8 to 40. In the sample the minimum value of the total sensation seeking score was 10 and the maximal value 39, thereby covering nearly the whole range of potential scores. The average total sensation seeking score of the sample amounted to 25.23 with a standard deviation of 5.68. When controlling for gender, the mean of the total sensation seeking score for females was 25.32, for males 25.16 and for the one respondent who chose other gender 23. This corresponds with the absence of gender differences on the BSSS found by Hoyle et al. (2002, p. 407), whereas previous studies applying the SSS-V usually found that males scored higher on the sensation seeking scale than females (Pizam et al., 2001, p. 25; Zuckerman, 1979, p. 127). Litvin (2008) compared BSSS and SSS-V with a sample of university students from the U.S. and also identified significantly higher male mean scores for both scales (p. 443). Nevertheless, it appears that for visitors to this natural area in Norway the sensation seeking scores were quite similar for females and males. Regarding the relationship between the sensation seeking score and age, a statistically significant negative correlation of  $r = -.41$ ,  $p < .01$  was identified, corresponding to the decline of sensation seeking scores with age presented by Zuckerman (1979, pp. 122-126) and further findings that the sensation seeking trait is more characteristic of younger people (Eachus, 2004, p. 149). Zuckerman (1979) explained this with biological correlates, generational differences as well as with “experience in life that leads to increasing conservatism and decreased risk taking” (p. 126).

Comparing the mean total sensation seeking score across the nationalities showed some variation across countries, which corresponds to Zuckerman's (1979) expectation that different childhood environments could affect sensation seeking (pp. 127-129). Nevertheless, considering that most nationalities were only represented by a very small number compared to the overall sample, making general inferences for individual nationalities would not be validated, but it can be identified that for Norwegians the average total sensation seeking score was with 25.51 slightly above the total mean of 25.23 (see Table E1). Finally, the sensation seeking score was examined with regard to the experience level, which was calculated with Spearman's rho ( $\rho$ ) due to the ordinal level of measurement of experience (Bryman & Bell, 2003, p. 244), and amounted to  $\rho = .17, p < .05$ . This indicates that higher sensation seeking corresponds with higher experience level and conforms to previous findings that experienced mountaineers have high total sensation seeking scores (Pomfret, 2006, p. 118). Consequently, the relationships between the sensation seeking score and the sociodemographic characteristics correspond to previous study findings, providing support for the representativeness of the sample with regard to sensation seeking and the generalizability of the findings concerning the total sensation seeking score as is later examined in more detail.

**Correlation analysis.** After analysing the sensation seeking scores of the sample with regard to the different sociodemographic characteristics, the conceptual model was tested with the collected data, meaning the utility of sensation seeking in explaining motives and attitudes to management in natural areas was examined. Therefore, the correlation coefficients between the total sensation seeking score and each of the items were computed, which are presented in Table 1. As due to the results of the previous examination of the reliability and validity of the motive and attitude to management constructs, an aggregation of the items to the subdimensions was not conducted, a recoding of the items for an analysis on the item level

was not necessary. An examination of the scatterplots for these bivariate relationships showed that the same extents of agreement with the items went along with different degrees of sensation seeking, even though to various degrees for the items, meaning that while for some statements the scores clumped together, for others they were all over the place, therewith the assumptions of linearity and homoscedasticity were not fulfilled for some of the items (Pallant, 2010, pp. 74, 126). If the reader would like to have more detailed information about this, the author is happy to supply the details of this analysis. Despite of the assumptions not being fulfilled for some of the items, due to the previously pointed out robustness, the Pearson correlation coefficient was still conducted (Norman, 2010, pp. 627-628). In the following the results of the correlation calculation between the total sensation seeking score and the different motive and attitude to management items are presented.

Table 1

*Correlations of Sensation Seeking with Motive and Attitude to Management Items*

Item	Total Sensation Seeking Score
Motive_S1: I like visiting nature and meeting interesting people there particularly those who share my interest.	.13
Motive_S2: I enjoy visiting natural areas because it gives me the opportunity to spend time with family and friends.	.09
Motive_E1: I am likely to revisit natural settings where I enjoyed myself even if I expect nothing new in terms of stimulation and/or activities.	.05
Motive_E2: I am reluctant to visit natural areas which are remote.	.02
Motive_P1: I feel dissatisfied with my experience at a natural setting where there are no opportunities to enjoy pleasant scenery such as the countryside, mountains, lakes, waterfalls, etc.	.03
Motive_P2: I prefer to visit nature areas which offer the opportunity to engage in activities which I find stimulating and/or challenging.	.20*

Motive_W1: I stay away from areas in nature where I am likely to encounter potentially dangerous native animals.	-.31**
Motive_W2: Rather than observe the local wildlife that gathers around visitors I prefer actively to seek and interact with other types of animals which populate these areas.	.20*
Motive_F1: I like visiting nature to have time to reflect on life.	.18*
Motive_F2: I enjoy visiting natural areas because it gives me the opportunity to find inspiration in natural surroundings.	.11
Attitude_I1: I have no particular preferences about the kind of information I would like to receive in a natural area.	.11
Attitude_I2: prefer to engage in structured outdoor tours rather than taking a self-guided tour.	-.02
Attitude_F1: I like eating in areas of nature which are untouched rather than using designated areas.	.24**
Attitude_F2: I dislike primitive facilities at natural settings.	.08
Attitude_F3: I would prefer more and better signposting.	-.06
Attitude_F4: I think the placement of boardwalks over marshy areas is a good idea.	-.06
Attitude_PN1: Nature conservation should have the highest priority of all land uses in natural areas.	.09
Attitude_PN2: Off-trail hiking has a negative impact on wild-life and plants.	-.05
Attitude_RV1: In my opinion visitor rules are necessary in a natural setting to provide a positive visitor experience.	.06
Attitude_RV2: The management of nature areas should limit recreation use if the natural environment is threatened.	.08



Attitude\_RV3: I would support the management decision to close damaged areas of the natural area. .08

Attitude\_RV4: I would support the management decision to charge fees for using the natural area. -.04

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

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

Regarding the items that were derived from the Galloway and Lopez (1999) study, sensation seeking was as predicted significantly positively correlated with the *physical* item of preference for stimulating and/or challenging activities, the *wildlife* item of actively seeking wildlife and the *facilities* item of preference for eating in untouched areas, and was as predicted significantly negatively correlated with the *wildlife* item of avoiding potentially dangerous animals (see Table 1). That the preference for natural areas that offer the opportunity to engage in stimulating and/or challenging activities was positively correlated with sensation seeking also corresponds with previous findings that higher sensation seekers prefer high-energy, outdoor-type activities (Pizam et al., 2004, p. 258), and reflects the tendency to seek stimulating situations incorporated in the sensation seeking trait (Zuckerman, 1979, p. 11). Furthermore, that the positive relationship Galloway and Lopez (1999) predicted between sensation seeking and the preference for eating in untouched areas was found to hold for data collected in a natural area in the Norwegian context also does not surprise considering that natural areas in Norway are characterized by a low degree of infrastructural measures (Haukeland et al., 2010, p. 254), and it corresponds to the need for varied experiences and the choice of external stimuli that maximize sensations by higher sensation seekers, which eating in untouched areas is more likely to offer than using designated areas (Zuckerman, 1979, pp. 10-11). What was more surprising were the significant relationships between sensation seeking and the wildlife items, as even though the questionnaire referred to natural areas in general, taking into account that there are not many opportunities for viewing diverse wildlife in Norway because other animals than elk and deer are very rare and only found in less populated areas in Norway (Stavanger Chamber of

Commerce, 2019, p. 6), significant relationships for these motive items were expected to be less likely than for the other categories. Nevertheless, the significant relationships might be explained by the popularity of hunting as an outdoor activity in Norway (Norwegian Environment Agency, 2015), which was also pointed out by a respondent in the pretest as previously mentioned and as the wildlife items are stated quite generally they could possibly refer to hunting (see Appendix B). Previous studies also found hunting to be a more preferred activity by high sensation seekers than low sensation seekers (Pizam et al., 2004, p. 255), therewith providing support for the found relationship between sensation seeking and the *wildlife* items. Moreover, especially the negative correlation with the *wildlife* item of avoiding potentially dangerous animals corresponds with the willingness to take physical risks for sensations as included in the definition of sensation seeking according to Zuckerman (1979, p. 10). In addition, sensation seeking was as predicted by Galloway and Lopez (1999) positively correlated with the *social* motive of meeting interesting people, the *physical* item of being dissatisfied with a lack of pleasant scenery and as predicted negatively correlated with the *information* item of preference for structured tours (see Table 1), even though these correlations were not statistically significant, thereby not allowing a generalization of these findings.

For the following items derived from Galloway and Lopez (1999), the relationship between sensation seeking and the items differed from the predicted one, meaning that sensation seeking was positively correlated with the *social* motive of spending time with family and friends, the *escape* item of revisiting places that offer nothing new in terms of stimulation and/or activities, the *escape* item of being reluctant to visit natural areas that are remote, the *information* item of no particular preferences about information and the *facilities* item of disliking primitive facilities instead of the predicted negative relationship (see Table 1). The different relationship direction might be due to an underdevelopment of the measures,

so were the two attitude to management items negatively worded, which could have caused misunderstandings by the respondents and biased the relationship as was previously outlined in the examination of the data quality when assessing the face validity of the measures (Churchill, 1979, pp. 69-70). In addition, the *escape* items might have been difficult to understand for the respondents due to complicated wording, causing measurement error and distorting the relationship (Churchill, 1979, pp. 69-70). In this regard, also the previous consideration that for the respondents in this context remoteness and that the area offers something new might not be related in one motive category can be mentioned, indicating that contextual factors might be the reason for the different relationship direction. Nevertheless, due to the lack of statistical significance it is not possible to make conclusive statements and further research would be necessary in this regard, which is examined in more detail in the Discussion part.

In the following, the correlations between sensation seeking and the items derived from other studies in the natural area tourism context are examined, for which a prediction of the relationship was not possible due to a lack of research on sensation seeking regarding these aspects. The correlation between sensation seeking and the *focus on self* item of having time to reflect on life was statistically significant positive (see Table 1). With the other *focus on self* item the correlation of sensation seeking was also positive, although not significant, but considering the good reliability and validity of the *focus on self* construct it seems valid to make inferences based on this finding. A possible reason for the positive relationship between sensation seeking and the *focus on self* item might be that higher sensation seekers have a higher need for the possibility to reflect on their life due to having more intense experiences than lower sensation seekers with the sensation seeking personality trait defined as “the need for varied, novel and complex sensations and experiences” (Zuckerman, 1979, p. 10). Even though this remains speculative as the *focus on self* motive to visit natural areas has not been

studied with regard to sensation seeking yet, therewith providing a potential point of departure for further research. The correlation between sensation seeking and the other two *facilities* items that were not derived from Galloway and Lopez (1999), meaning the preference for more and better signposting and for the placement of boardwalks, were not statistically significant, but negative (see Table 1), and therewith correspond with the assumption that higher sensation seekers oppose more facilities as it would likely reduce the perceived risks associated with the recreation activity performed in the natural area, and as the willingness to take risks for new experiences is part of the sensation seeking trait (Haukeland et al., 2011, p. 30; Zuckerman, 1979, pp. 10, 183). Furthermore, sensation seeking was positively correlated with the *protection of nature* item that nature conservation should have the highest priority of all land uses (see Table 1), therefore contradicting the previous made assumption that higher sensation seekers might put the fulfilment of their need for varied and novel experiences over the protection of the natural environment. Although the negative correlation of sensation seeking with the *protection of nature* item that off-trail hiking has a negative impact might support that assumption (see Table 1), but it must also be kept in mind that on average respondents were neutral with that statement (mean = 2.85, see Table C1), possibly indicating a lack of awareness of the negative impacts of off-trail hiking on the environment. The correlations between sensation seeking and the *regulation of visitor* items were all positive except for the last item related to charging fees (see Table 1), thereby not corresponding with the assumption that higher sensation seekers are more likely to disobey instructions in a natural area (Galloway, 1998, p. 104). Regarding the support for the charging of fees to visit natural areas, it must be considered that on average respondents did not agree with that item (mean = 2.52, see Table C1), providing support for the findings of Denstadli et al. (2010), who explained the strong opposition to fees with the Norwegian tradition of open access to nature on either private or public land (p. 369). This opposition is apparently even higher for

high sensation seekers considering the negative correlation. Nevertheless, it must be kept in mind, that the correlations of these attitude to management items with sensation seeking were not statistically significant and small (Pallant, 2010, p. 134), therewith limiting the generalizability of these findings.

Finally, only one of the correlations in Table 1 has an effect size above .30 and therewith indicates a medium strength of relationship, whereas all other correlations were smaller or even below 0.1 and consequently not even designating a small relationship according to J. Cohen (1988, pp. 80, 532). This could be explained with the limitations of the study that are outlined in the Discussion part. However, due to the large sample of more than 100 respondents, even very small correlations reached statistical significance (Pallant, 2010, p. 135), which enables to draw some generalizable conclusions that are also further discussed in the Discussion section.

**Regression analysis.** Before these findings are discussed in more detail in the next part, the results of the regression analysis are presented, which was conducted in addition to the correlation analysis to enrich the data analysis as outlined in the Method section. First, standard regressions with sensation seeking as the independent variable and the motive and attitude to management items as the dependent variables were conducted. Table E2 in the Appendix includes the R square values, which tell how much of the variance in the dependent variable is explained by the sensation seeking variable, and the standardized coefficients Beta, indicating if sensation seeking is making a significant contribution to the prediction of the dependent variable (Pallant, 2010, pp. 160-161). The items to which sensation seeking made a statistically significant contribution corresponded with the items for which the correlation with the total sensation seeking score was significant, as expected since regression is based on correlations (Pallant, 2010, p. 148). The results of the standard regressions are resumed when compared to the hierarchical multiple regressions that were computed subsequently.

For the hierarchical multiple regressions, variables are entered in blocks and each independent variable is assessed “in terms of what it adds to the prediction of the dependent variable after the previous variables have been controlled for” (Pallant, 2010, p. 149). The hierarchical multiple regressions therefore enabled to evaluate the predictive ability of sensation seeking after the effects of the control variables, namely gender, age, nationality and experience level, were controlled for (Pallant, 2010, p. 149). Therefore, the control variables were entered in Block 1 and then the total sensation seeking score in Block 2, whereas the different motive and attitude to management items constituted the dependent variables. In order to conduct multiple regressions, it was necessary to dichotomize the nominal variables gender and nationality (Pallant, 2010, p. 153), therefore the one case with gender “other” was excluded for this analysis for simplification, so that the value 1 was assigned to female and value 2 to male and a total of 150 questionnaires were used for the analysis. For nationality it was differentiated between “Norwegian” and “other nationalities”, whereas value 1 was assigned to Norwegian nationality and value 0 to other nationalities. Preliminary analyses were also conducted to ensure that the assumptions were not violated by examining the Normal Probability Plot (p-p) of the Regression Standardized Residual and the scatterplots for all the dependent variables, which suggested for most of the items a fulfilment of the assumptions (Pallant, 2010, pp. 161, 167). Even though, as previously mentioned regression is a robust technique with regard to violations of its assumptions. If the reader wishes for more details about this preliminary analysis, please contact the author for the supply of the respective information.

Table E3 in the Appendix includes for all the motive and attitude to management items the R square value of the first model, meaning the variance explained by the model after the control variables have been entered in Block 1; the R square value of the second final model, which tells how much of the variance in the dependent variable is explained after the variable

in Block 2, namely sensation seeking, has also been included; the R square change value, showing the additional percentage of the variance in the dependent variable explained by the independent variable sensation seeking when the effects of the control variables are controlled for; and the standardized coefficients Beta of the whole model, meaning the model that includes all variables from both blocks, that give information about the unique contribution of each independent variable to explaining the dependent variable controlling for the variance explained by all other variables in the final model, whereas the significant variables are marked accordingly (Pallant, 2010, pp. 161, 165-166). The calculations were thereby based on the exact numbers, but for brevity and simplicity only two decimal places were included in the table, in correspondence with the previous approach of presenting the results with two decimal places. The significance levels were chosen as 0.05 and 0.01 in accordance with J. Cohen (1988, p. 531) and Pallant (2010, p. 161). It was found that for the following items, the overall variance in the dependent variable explained by sensation seeking after the effects of the control variables were controlled for, was statistically significant: the *physical* item of preference for stimulating and/or challenging activities (R square change = 4%), the *wildlife* item of avoiding potentially dangerous animals (R square change = 11%), the *wildlife* item of actively seeking wildlife (R square change = 3%), the *focus on self* item of having time to reflect on life (R square change = 3%) and the *facilities* item of preference for eating in untouched areas (R square change = 4%) (see Table E3), corresponding with the items for which the R square value of the standard regression model with sensation seeking only was significant (see Table E2). Even though the contribution was statistically significant, the R square change values were still quite low, meaning that the increase in the percentage of the explained variance in the dependent variable through incorporating sensation seeking in the model was not that high (Neuman, 2014, p. 421; Pallant, 2010, p. 165). Nevertheless, for these items the R square change value and therewith the variance in the dependent variable

explained by sensation seeking after the effects of the control variables were controlled for, was only for two items by one percentage point lower and for one item by two percentage points lower than the variance explained by sensation seeking in the standard regression model without the control variables (see Table E2 and Table E3), implying that controlling for the effect of the control variables did not reduce the explanatory power of sensation seeking with regard to the variance in these motive and attitude to management items considerably and that the control variables therefore did not constitute confounding variables, meaning variables that are not part of the hypothesis but threaten the internal validity (Neuman, 2014, pp. 283, 320).

Subsequently, the contribution of each of the variables to the final equation, meaning to the explanation of the dependent variable with all variables entered into the equation, is evaluated by examining the standardized coefficients Beta (Pallant, 2010, p. 166). It can be stated that sensation seeking made a statistically significant unique contribution to the prediction of the extent of agreement with the *physical* item of preference for stimulating and/or challenging activities, the *wildlife* item of avoiding potentially dangerous animals, the *wildlife* item of actively seeking wildlife, the *focus on self* item of having time to reflect on life and the *facilities* item of preference for eating in untouched areas (see Table E3). This corresponds with the items for which the sensation seeking variable made a statistically significant contribution in the standard regression model as well as with the items for which the R square change value by introducing sensation seeking in the hierarchical multiple regression model was statistically significant and it is also consistent with the results of the correlation analysis. Consequently, an interpretation of the findings was already conducted above, but in addition it can be stated that for the *wildlife* item of actively seeking wildlife and the *facilities* item of preference for eating in untouched areas, sensation seeking was the only independent variable making a statistically significant unique contribution to the prediction of



the dependent variable (see Table E3), meaning that for these items the sensation seeking variable is likely to operate on these motives and attitudes to management instead of the control variables (Neuman, 2014, p. 76). Moreover, a comparison of the standardized coefficients Beta between the standard regression model and the hierarchical multiple regression model for the items for which the regression coefficients of sensation seeking were significant showed that the regression coefficients for the hierarchical regression model were slightly higher than for the standard regression model except for one item with a slightly lower value (see Table E2 and Table E3), indicating that controlling for the effect of the control variables did not reduce the effect of sensation seeking on the extent of agreement with these items and thereby providing support that the control variables did not confound the relationship between sensation seeking and these items as outlined above (Neuman, 2014, pp. 283, 320).

The control variable gender made a statistically significant unique contribution to the prediction of the *social* item of spending time with family and friends, the *focus on self* item of having time to reflect on life and the *protection of nature* item that off-trail hiking has a negative impact, whereas the sociodemographic control variable age showed a statistically significant unique contribution only to the *wildlife* item of avoiding potentially dangerous animals (see Table E3). The negative standardized coefficient Beta of gender for the *social* motive of spending time with family and friends corresponds to the findings of previous studies examining gender differences on motivation factors to visit natural areas that women were more interested in bonding with family and friends (Meng & Uysal, 2008, pp. 456-457). Furthermore, the negative standardized coefficient Beta for the *protection of nature* item is supported by previous findings that women scored higher on scales measuring environmental attitudes (Bjerke et al., 2006, pp. 116, 122). In addition, the negative standardized coefficient Beta for the *focus on self* motive of having time to reflect on life also corresponds with

previous findings that women are more open to introspection and self-reflection (Csank & Conway, 2004, pp. 478-479). Whereas the finding that age contributed to the explanation of the *wildlife* motive of staying away from potentially dangerous animals is surprising, considering that the standardized coefficient Beta was negative (see Table E3), indicating that older people are less likely to stay away from areas where they are likely to encounter dangerous animals (Pallant, 2010, p. 162). This is contradictory to previous findings that fear of carnivore species among the Norwegian public increases with age (Røskoft, Bjerke, Kaltenborn, Linnell & Andersen, 2003, p. 189). However, previous study findings also showed that the popularity of hunting declines among younger people (Skogen, 2001, p. 210), implying that hunting is more popular among older people and therewith they are probably also less likely to avoid areas with potentially dangerous animals as these animals present possible hunting objects.

The dichotomized nationality variable exhibited a statistically significant unique contribution to the *physical* motive item of preference for stimulating and/or challenging activities, the *focus on self* motive item of finding inspiration in natural surroundings, the *information* item of preference for structured tours, the *facilities* item of preference for more and better signposting, the *protection of nature* items that nature conservation should have the highest priority of all land uses and that off-trail hiking has a negative impact and the *regulation of visitor* items that visitor rules are necessary for a positive visitor experience and that recreation use should be limited if the natural environment is threatened (see Table E3). The standardized coefficients for the *regulation of visitor* items were thereby all negative and therefore correspond to the findings of Denstadli et al. (2010) that Norwegian residents are less supportive of regulatory actions in natural areas (pp. 369-370). Moreover, the negative standardized coefficient for the *facilities* item is also supported by “the Nordic emphasis on traditional, undeveloped trails in natural areas” (Denstadli et al., 2010, p. 369). Nevertheless,

the negative standardized coefficients for the *protection of nature* items surprise considering that previous studies found Norwegians to be rather environmental-conscious (Bjerke et al., 2006, p. 125).

The control variable experience with outdoor activity made a statistically significant unique contribution to both *social* items of meeting interesting people and of spending time with family and friends, the *information* item of no particular preferences about information and the *facilities* item of disliking primitive facilities (see Table E3). The positive standardized coefficients for the *social* motives are thereby contradictory to previous findings that mountaineers with less experience are more motivated by socialising (Pomfret & Bramwell, 2016, p. 1470), whereas the negative standardized coefficients for the attitude to management items are plausible as it can be assumed that more experienced mountaineers have more specific information requirements in contrast to general information and do not dislike primitive facilities as they enact useful cues and knowledge through their experience making facilities less necessary (Ewert, 1994, p. 8).

Consequently, the control variable nationality was the independent variable that made to the most items a statistically significant unique contribution compared to the other independent variables when the final model of the hierarchical multiple regression was examined, followed by sensation seeking, which is discussed further in the subsequent part. Even though, it must be considered that the sampling was aimed at achieving a sample that mirrors the sensation seeking scores of the population and a representative sampling procedure was not applied, therewith limiting the generalizability and external validity of the findings concerning the sociodemographic characteristics outlined above (Neuman, 2014, p. 221).

Regarding the R square values of the whole model, for the following items the final model reached statistical significance: the *social* item of spending time with family and

friends (R square = 12%), the *physical* item of preference for stimulating and/or challenging activities (R square = 8%), the *wildlife* item of avoiding potentially dangerous animals (R square = 21%), the *focus on self* item of having time to reflect on life (R square = 11%), the *focus on self* item of finding inspiration in natural surroundings (R square = 14%), the *information* item of preference for structured tours (R square = 9%), the *facilities* item of preference for eating in untouched areas (R square = 11%), the *facilities* item of disliking primitive facilities (R square = 8%), the *facilities* item of preference for more and better signposting (R square = 9%), the *protection of nature* item that off-trail hiking has a negative impact (R square = 11%) and the *regulation of visitor* item that recreation use should be limited if the natural environment is threatened (R square = 8%), and therewith for half of all the items (see Table E3). For the other motive and attitude to management items for which the model did not reach statistical significance, multiple correlations in the population equalled zero, showing that there is no significant association between the predictors as a set and the dependent variable (Hoyt, Leierer & Millington, 2006, p. 225; Pallant, 2010, pp. 160-161). Furthermore, the R square values for the items for which the whole model reached statistical significance were still quite low, therefore explaining only a small to medium percentage of the variance in the dependent variable (Neuman, 2014, p. 221; Pallant, 2010, p. 160), which on the one hand might indicate that other variables not covered in the conceptual model of the thesis might contribute to explaining the variance in these items and on the other hand it might provide further support for the underdevelopment of the measures for the motives and attitudes to management. Nevertheless, the model as a whole with sensation seeking and the control variables reached for more items statistical significance than the standard regression with sensation seeking only did (see Table E2 and Table E3), implying that through incorporating the control variables in the model more variance in the motives to visit nature areas and the attitudes to natural area management can be explained than solely by sensation

seeking. In this regard it can also be stated that the first model in the hierarchical multiple regression after the control variables have been entered in Block 1 also reached for more items statistical significance than the standard regression with sensation seeking only did (see Table E2 and Table E3), which might imply a limited utility of sensation seeking in explaining the motives and attitudes to management in natural areas compared to the control variables as is discussed in more detail in the next chapter.

Another finding of the hierarchical multiple regression was that the regression coefficients of the control variables changed with the introduction of sensation seeking in the model, especially for the control variables age and experience, corresponding to the previous found correlation between sensation seeking and these sociodemographic characteristics, which might indicate multicollinearity that exists when the independent variables are highly correlated (Pallant, 2010, p. 151). Nevertheless, an examination of the Tolerance and Variance Inflation Factors (VIF) for the hierarchical multiple regressions showed that for all items the indicators were in the acceptable range, therefore the multicollinearity assumption should not be violated for the regressions (Pallant, 2010, p. 158). If the reader wishes more information on this analysis, please contact the author for the supplement of the respective material.

Furthermore, the regression coefficients for the items were examined in order to identify if items of the same constructs yielded similar regression coefficients and therewith hinting at a possible pattern for the items of these constructs that would support an aggregation of the corresponding items. For the *wildlife* items the regression coefficients were opposite for all variables, supporting an aggregation of the items considering that one of the items would have to be recoded for an aggregation (see Table E3), corresponding with the result of the reliability examination. For the *focus on self* items the regression coefficients were similar for all independent variables as well as for the *regulation of visitor* items exempt

for the standardized coefficient Beta for sensation seeking for the last item, therewith aligning to the findings of the reliability and validity analysis. A similar pattern in the regression coefficients was also found for the *protection of nature* items with the exception of the experience control variable, which surprises considering the previous assessed low reliability and validity of this construct (see Table E3). Consequently, the regression analysis and the relationships with sensation seeking gave additional information about possible patterns for aggregating the items and therefore provide support for a meaningful replication with aggregated items, even though adaptations are necessary to increase the reliability and validity of the constructs as is further outlined in the Discussion section.

In conclusion, the results of the data analysis showed that whereas for some items there were significant correlations with sensation seeking and the sensation seeking score made a statistically significant unique contribution to their explanation, even after controlling for the effect of the control variables, for other items a significant relationship between sensation seeking and the items was not found. Therefore, the in the conceptual model part outlined hypotheses only hold true for some items, and the personality variable sensation seeking seems to be able to explain only some motives and attitudes to management in natural areas, which is discussed in more detail in the following. Nevertheless, it must also be considered that due to a lack of reliability and validity, an aggregation of the motive and attitude to management items to overall constructs was not possible, which would have enabled to avoid the shortcomings of conducting the analysis on the item level (Churchill, 1979, p. 66). These limitations are also examined further in the following Discussion part.

## Discussion

### **The Utility of Sensation Seeking in Explaining Motives and Attitudes to Management in Natural Areas**

Based on the results it can be summarized that the BSSS measuring sensation seeking enacted good reliability and validity, whereas for the measures of the effect categories only the *social* and *focus on self* motive exhibited sufficient reliability and validity and also the attitude to management concept *regulation of visitors* showed with the exception of the item related to charging fees some validity. The other measures for the motive and attitude to management concepts lacked this reliability and validity, requiring an analysis on the item level as a consequence, which caused limitations that are later described in more detail. Especially, the constructs *escape* as a motive and *information* and *protection of nature* as part of the natural area management demonstrated low reliability and validity. The *escape* motive was obtained from the Galloway and Lopez (1999) study and assumed that escape can be achieved through visiting remote places that offer something new in terms of stimulation or activities (p. 666). However, the analysis showed that the likelihood of revisiting natural settings was negatively associated with the reluctance of visiting remote areas and that therewith for the respondents these items might not relate to one motive category. This might be explained with the different contexts of this thesis and the study by Galloway and Lopez (1999), as Galloway and Lopez (1999) asked students about potential visits to national parks and considering that these parks were probably not quite close or easy reachable it is likely that revisiting a park was less favourable for them, whereas in this thesis actual visitors to a nearby nature area were sampled and the close distance to the cities of Stavanger and Sandnes made it more likely that respondents living in the area visited that nature area frequently and therefore they might have been more likely to agree with the statement of being likely to revisit areas, which also corresponds with the popularity of hiking in Norway to the extent

where it becomes a ritualized activity with almost every Norwegian going hiking sometimes, so that the focus might be more on the outdoor activity itself and the meaning derived from hiking than on the nature area and if it offers something new (Svarstad, 2010, pp. 91, 106). As a consequence, a revision of the conceptual definition of the *escape* motive and an adaption to the natural area and the Norwegian context might be necessary. However, poor measures might also be the reason for the low reliability and further research is necessary in this regard. The items of the *information* construct were also derived from the Galloway and Lopez (1999) study. Here again the context could have caused the low reliability and validity results, meaning that structured tours might be less seen as a way to get information in the Norwegian context. Nevertheless, the low preference on average for engaging in structured tours (mean = 2.02, see Table C1), is surprising considering the number and variety of guided tours that the Norwegian Trekking Association (Den Norske Turistforening, DNT) offers since 1932 (Leister, 2019, p. 45), which would indicate that poor measurement development might be the reason for the low reliability and validity, including the negative wording of one of the information items that could have caused error and distorted the analysis as previously outlined. Regarding the *protection of nature* items that were derived from the study by Arnberger et al. (2012, p. 52), the off-trail hiking item seemed to cause the lack of reliability and validity of the overall construct. This also becomes apparent when comparing the average agreement with the statement in this thesis, which was between disagree and neutral (mean = 2.85, see Table C1), with the one in the study by Arnberger et al. (2012), where 80% of the participants agreed with that statement (p. 51), which might indicate a lack of awareness of the negative impacts of off-trail hiking by the visitors to natural areas in the Norwegian context. Additionally, the low agreement with that statement could possibly be explained by the Nordic preference for traditional, undeveloped trails in natural areas (Denstadli et al., 2010, p. 369), which is also supported by the negative standardized coefficient Beta of



nationality for this item (see Table E3). In addition, examining the regression coefficients of the hierarchical multiple regression showed for the *protection of nature* items with the exception of the experience control variable similar patterns, providing support for a potential aggregation of the items with regard to analysing the relationship with sensation seeking. Consequently, these constructs require further assessment in order to develop unidimensional concepts and better measures for a possible replication of the study in the Nordic context while also offering interesting potential points of departure for further research.

Regarding the main findings of the resulting analysis between the overall sensation seeking score and the effect items, it can be stated that there were significant positive correlations between sensation seeking and the *physical* item of preference for stimulating and/or challenging activities, the *wildlife* item of actively seeking wildlife, the *focus on self* item of having time to reflect on life and the *facilities* item of preference for eating in untouched areas, and a significant negative correlation between sensation seeking and the *wildlife* item of avoiding potentially dangerous animals. Furthermore, the standardized coefficients Beta for sensation seeking of the standard regression and the hierarchical multiple regression were also statistically significant for these items. Sensation seeking might therefore be a possible reason to explain why some visitors prefer to visit nature areas that offer the opportunity to engage in stimulating or challenging activities, why some visitors do not stay away from areas where they are likely to encounter dangerous animals, why they prefer to actively seek animals of the area and why some visitors like to visit natural areas to have time to reflect on life as well as why some visitors prefer eating in untouched areas instead of using designated areas and others do not. Nevertheless, these findings must be interpreted with caution considering the analysis on the item level and that correlations only indicate associations but not causality (Neuman, 2014, p. 75), which is later also examined further. Possible reasons for these relationships were already pointed out in the Results part. In

addition, the relationship direction corresponded for these significant findings with the predicted one based on Galloway and Lopez (1999), except for the *focus on self* item, for which a direction of the relationship was not predicted due to the lack of research on this motive with regard to sensation seeking in the natural area context. The *focus on self* motive therefore seems to be an interesting concept to examine further with regard to sensation seeking, especially considering the importance of this motive indicated by the average agreement of the respondents with these items (see Table C1). Furthermore, the *wildlife* motive holds potential for further research, due to the significant relationship with sensation seeking even though there are not many diverse kinds of wildlife and rarely potentially dangerous wildlife in Norway, especially in the area where the data collection took place (Stavanger Chamber of Commerce, 2019, p. 6), as it was already discussed in the previous section. Comparing these findings with the significant correlations Galloway and Lopez (1999) found in their study, it can be stated that they also identified significant correlations for the *physical* item of preference for stimulating and/or challenging activities, the *wildlife* item of actively seeking wildlife and the *wildlife* item of avoiding potentially dangerous animals, although their application of a different correlation measure limits the comparability of the findings.

For the other items that were derived from Galloway and Lopez (1999) and for which a significant relationship with sensation seeking was not found, the relationship direction corresponded with the predicted one for some items and for others not as described in the Results section. That for the items, for which the relationship direction did not correspond with the predicted one, the relationships with sensation seeking were not statistically significant, might provide some support for the predicted relationship directions derived from Galloway and Lopez (1999), even though due to the lack of statistical significance it is not possible to make conclusive statements about these items. Regarding the other attitude to

management items, for which a direction of the relationship with sensation seeking was not predicted due to a lack of research on sensation seeking with regard to these concepts, relationship directions corresponded with the previous made assumptions for some concepts while for other concepts they were contradictory to the assumptions made, but due to these relationships not being statistically significant, it is also not possible to make generalizable statements about the relationship between sensation seeking and these attitudes.

Consequently, in total there are more effect items with which sensation seeking did not have a significant relationship than the ones for which a significant correlation was calculated, therefore the test of the conceptual model with the data showed that some adaptations and a retesting might be necessary to make more conclusive statements about the relationships between sensation seeking and the motives and attitudes to management in natural areas. If statements based on this data were to be made to answer the initial research questions, it could be retained that there were more significant relationships of sensation seeking with the motives to visit nature areas than with the attitudes to natural area management. Specifically, with regard to Research Questions 1a and 1b, there were significant relationships between sensation seeking and four of the motive items for visiting natural areas and for these four motive items sensation seeking explained a significant amount of variance in these items, even after controlling for the effect of the control variables (see Table 1, Table E2 and Table E3). Regarding the Research Questions 2a and 2b, there was only one significant relationship between sensation seeking and the attitudes to the management of natural areas and only for this *facilities* item explained sensation seeking a significant amount of variance in the attitude to the management of natural areas (see Table 1, Table E2 and Table E3).

Furthermore, as it was previously outlined in the description of the research design, when causality is examined, it must be ensured that there is no spuriousness, which is

achieved by identifying possible alternative causes, namely the control variables, and measuring them (Neuman, 2014, pp. 74-76). Through integrating the control variables, it was also controlled for the heterogeneity of the sample considering that a homogenous sample was recommended for theory testing according to Calder et al. (1981, p. 200) as described above. In this regard, hierarchical multiple regressions were calculated to compare the effect of sensation seeking on the motive and attitude items with that of the control variables and it was found that nationality, specifically the differentiation between “Norwegian” and “other nationality”, made a statistically significant unique contribution to the prediction of more items than sensation seeking, therefore nationality seems to have further potential in understanding visitors to natural areas, which was also pointed out by Pomfret and Bramwell (2016) in their study of mountaineer tourists (p. 1474). Although, concerning the sociodemographic findings, it must be kept in mind that the sampling procedure did not yield a representative sample with regard to these characteristics, therewith limiting the generalizability and external validity of these findings (Neuman, 2014, p. 221). In addition, it was found that the effect of sensation seeking on the motive and attitude to management items, for which a significant relationship with sensation seeking was calculated, was not considerably affected by controlling for the effect of the control variables as outlined in the Results section, which provides support that the control variables did not confound the relationship between sensation seeking and these items and therefore for the internal validity of the study. Even though, only for two items sensation seeking was the only independent variable making a statistically significant unique contribution to the prediction of the dependent variable, namely for the *wildlife* item of actively seeking wildlife and the *facilities* item of preference for eating in untouched areas (see Table E3), therefore it is not possible to eliminate alternative explanations for the other effect variables, implying that the internal validity could still be improved (Neuman, 2014, p. 221). Consequently, further research

would be necessary to establish a causal explanation of motives and attitudes to management in natural areas with sensation seeking, for example through an experimental design that allows time ordering and manipulation of variables (Bryman & Bell, 2003, p. 49; Neuman, 2014, p. 74).

Moreover, even though for half of the motive and attitude items the model with sensation seeking and the control variables as the independent variables reached statistical significance, indicating that at least some variance in the effect items can be explained with sensation seeking and the control variables, the percentage value of the variance in the dependent variable that was explained by the model was still quite low. This might on the one hand indicate that there are several factors influencing what motivates visitors to natural areas and how their attitudes to the management of nature areas are, which would imply the need to revise the conceptual model, and on the other hand might provide further support for the underdevelopment of the measures.

In conclusion, the utility of sensation seeking in explaining motives and attitudes to management in natural areas based on the data collected at a natural area near the Norwegian city of Stavanger seems limited and the significant relationships, that were assumed based on previous research that found sensation seeking to be a useful psychometric tool in tourism research as described in the literature review, only hold for some items. However, it must be noted that the examination of the sensation seeking scores with regard to the sociodemographic characteristics corresponded with previous studies, for example regarding the relationship between the sensation seeking score and age or experience, therewith indicating that the limited number of significant findings might have to do with the conceptualization and operationalization of the motives and attitudes to management. This is also supported by the reliability and validity analysis, which found good reliability and validity for the BSSS measuring sensation seeking, but not for the motive and attitude to

management concepts. In the following, comparisons are drawn to the study from which the motive and attitude items, that were already examined with regard to sensation seeking, were derived, and possible reasons for not getting the results as expected from these measures as well as further limitations are discussed.

### **Limitations of the Study**

Comparisons with the study by Galloway and Lopez (1999), from which the items for which a relationship direction could be predicted were derived, showed that for five items the relationship direction was different than predicted, even though not statistically significant. Here the context might have caused different results, as whereas the study by Galloway and Lopez (1999) was conducted with students in the U.S. and therefore with native English speakers and potential national park visitors, for this thesis actual visitors to nearby, nature areas in Norway were sampled, who can be assumed to have English not as their mother language except for the respondents with nationality from an English-speaking country, who made up only a small amount of the sample (see Table E1). Consequently, the findings indicate that place might make a difference for the applicability of the measures (Bryman & Bell, 2003, p. 171). In addition, since the study by Galloway and Lopez (1999) more than 20 years have passed, therefore changes might have occurred since then, so that the language might seem outdated today and the indicators might need refinement (Bryman & Bell, 2003, p. 171). Consequently, a more concrete adaption of the measures and the conceptual model to the present application, namely the Norwegian as well as the natural area context, might have been necessary. In addition to different contexts of the studies from which the questionnaire items were derived, there are further limitations that could have caused low reliability and validity of some of the concepts, non-significant relationships between sensation seeking and the motives and attitudes and therewith a lower utility of sensation seeking in explaining these motives and attitudes.

These limitations include next to the negatively worded items, for which the wording might have distorted the relationship as previously explained, terminology in the items that might have been unfamiliar to the respondents such as words like “remote” and “primitive” and complicated wording, which came up as issues during the actual data collection, even though they did not pose a problem to the respondents of the pretest, showing that a more extensive pretest might have been necessary, including an expert study to identify these possible flaws of the questionnaire (Demaio & Landreth, 2004, p. 60). Therewith, these issues also imply a possible lack of face validity, despite of the derivation of the items from existing research published in peer-reviewed journals (Neuman, 2014, p. 216). Another limitation in this regard is the combination of items from different studies for the motives and attitudes to management, therefore these items had not been tested in this compilation in research before, leading to lower face validity for these measures than for the BSSS that was tested in this form already in other studies as previously mentioned. Moreover, having more than two to four indicators for the motive and attitude to management concepts would have been better, as multiple indicators increase reliability (Neuman, 2014, p. 214). In addition, a conceptual refinement of the effects including having more specific effect categories would have reduced the uniqueness of the items of one category, therefore contributing to more unidimensional constructs, for which all indicators fit together and indicate a single construct (Neuman, 2014, p. 225). This would have likely increased the reliability and validity of the constructs and thereby allowing to aggregate the items to the constructs, which would have been favourable for the analysis since having multi-item measures instead of individual items has the advantage of averaging out the specificity of individual items when they are combined, allowing for finer distinctions among respondents and increasing reliability while measurement error decreases with increasing number of items (Churchill, 1979, p. 66). Consequently, the concepts and measures for the motives and attitudes seem to be not well

enough developed and adapted to the present application, therewith implying the need for a replication with better developed, unidimensional constructs and improved measures consisting of multiple indicators that contain less uniqueness.

In addition, complementing the conceptual model with other possible effect categories, for example the activities engaged in during visits to natural areas (Pizam et al., 2004, p. 256), as well as the distinction between appreciative and consumptive activities and the corresponding assessment of the appropriateness of activities (Huang et al., 2008, pp. 65, 79), might have made significant contributions to the findings of this study. Especially, considering that previous studies found significant relationships between recreational activities and environmental values (Bjerke et al., 2006, p. 117). Therewith examining the utility of sensation seeking in explaining activity choices might provide useful information in order to extend the understanding of visitors to natural areas and to contribute to sustainable nature-based tourism.

Nevertheless, it is also necessary to consider the nature of the data collection, since asking respondents in the nature area to complete the survey in cold and partly windy weather conditions required a shorter questionnaire in order to reduce the response burden for the participants (Hays et al., 2012, p. 1403). However, even though it was tried to keep the questionnaire short, the cold and windy weather might have still caused some respondents to engage in satisficing, meaning to avoid “exerting the cognitive effort when answering survey questions and giving the least demanding answer” (Neuman, 2014, p. 334), in order to quickly finish the survey, which could have also distorted the relationships. The weather conditions also caused the achievement of a smaller sample than it was recommended based on the conceptual model. According to Norman (2010) “small samples require larger effects to achieve statistical significance” (p. 628). Consequently, that the sample size was below the recommended one might have also caused the limited amount of statistically significant



relationships between sensation seeking and the effect items, specifically since the analysis was conducted on the item level instead of on the category level as indicated in Figure 1, requiring an even larger sample than the 200 described in the Method section. With regard to the sample, another limitation of the study is the convenience sampling procedure, which limited the representativeness of the sample and therewith also the generalizability of the findings, especially those that go beyond the theory testing of sensation seeking and refer to the sociodemographic variables like nationality (Neuman, 2014, pp. 248-249). In addition, some specific characteristics of the Norwegian context were outlined, like the Right to Public Access, which on the hand might make a further adaption of the concepts and measures to this context necessary and on the other hand also limit generalizing the findings of this study to natural areas outside the Norwegian context. Consequently, the sampling procedure and the specific characteristics of the Norwegian context outlined previously limit generalizing from the sample of this thesis to visitors to natural areas in general and therewith the external validity might provide another limitation of the study (Neuman, 2014, p. 221).

The analysis on the item level might have also caused that the assumptions for the statistical techniques were not fulfilled for some items, including normality, linearity and homoscedasticity as previously outlined. Even though a robustness of the correlation and regression techniques was assumed (Norman, 2010, pp. 627-628), that the assumptions of the techniques were partly not fulfilled might pose a lack of statistical validity of the study as another limitation of this thesis. Statistical validity thereby refers to using the proper statistical procedures and meeting the mathematical requirements of the procedures (Neuman, 2014, p. 221). In addition, since the items of the motives and attitudes to management were not aggregated, they were strictly speaking not measured by Likert-type scales but by Likert-type items (Clason & Dormody, 1994, p. 31). Moreover, there is controversy in the literature on the measurement level of Likert data and the resulting debate about using parametric or

non-parametric techniques (Murray, 2013, p. 259; Pallant, 2010, p. 125). Here, an interval level of measurement was assumed due to the numerical descriptors, but it must be considered that non-parametric techniques like Spearman's rho and logistic regression might have yielded different results (Pallant, 2010, pp. 111, 128, 168).

With regard to the internal validity of the study, it was already outlined that survey research obtains a lack of certainty whether a discovered relationship denotes a causal relationship compared to experimental designs (Bryman & Bell, 2003, pp. 48-49). Another limitation is that further distinctions could have been made, which could have enriched the analysis by identifying possible alternative causes of the results and thereby improving the internal validity of the study (Neuman, 2014, p. 221). For example, the questionnaire could have included a distinction between residents and tourists, considering that previous studies found that management actions to regulate activities in natural areas are likely to be more opposed by residents than by tourists (Denstadli et al., 2010, pp. 369-371). In addition, a distinction between tourists and recreations could have been made, for example by asking the respondents if they stay overnight away from home (Pomfret & Bramwell, 2016, p. 1447). In addition, comparisons of the explanatory power of Zuckerman's sensation seeking theory with other psychological variables like Plog's and Cohen's psychographic research that have some similarities with sensation seeking theory could have enriched the analysis (Litvin, 2008, p. 441). In this regard also a combination of personality traits to characterize a person might constitute a stronger predictor of motives and attitudes in the natural area context (Galloway & Lopez, 1999, p. 670). Furthermore, the changing of the wording in the items derived from studies in the context of national parks, from "national park" to nature area/natural area/natural setting might have had a higher impact on the responses than initially thought, which is supported by previous findings that the designation as a national park increases visitation and that the name national park has a strong effect on the decision to visit

an area (Reinius & Fredman, 2007, p. 839; Weiler & Seidl, 2004, p. 245). These limitations provide potential points of departure for future research as outlined later.

### **Methodological, Theoretical and Managerial Implications**

Nevertheless, despite these limitations, implications of this study can still be derived. With regard to the methodological implications, the thesis found support for the reliability and validity of the BSSS measuring sensation seeking and therewith also showed that the scale is applicable to natural area visitors in the Norwegian context. In this regard, the thesis also contributes to close the research gap that was pointed out by Litvin (2008), specifically to validate the scale in a non-U.S. setting and with non-student samples (p. 445). By having a sample with a broad age range, the examination of the quality of the data showed that the BSSS is an effective measure of sensation seeking across generations (Litvin, 2008, p. 445). Consequently, the thesis provided further support of the BSSS as a reliable and valid measure of sensation seeking, also in the natural area context, whereas for the measures of the effect categories further development is necessary as outlined in the limitations.

Regarding the utility of the sensation seeking theory in explaining motives and attitudes to management in natural areas, only a limited number of significant relationships were derived, which might indicate a lack of applicability of sensation seeking as a psychometric tool in natural area tourism, nevertheless the limitations of the thesis, especially of the measures of the motives and attitudes to management might have distorted the relationships as outlined above. Therefore, further research would be necessary to assess the utility of sensation seeking in understanding visitors to natural areas and in this regard further conceptual and operational development of the motive and attitude to management constructs would be recommended. However, even though the number of significant relationships was limited, some significant results were derived that can contribute to fill the research gap of applying the sensation seeking construct in another nature setting than national parks and the

conceptual model and the found significant relationships provide potential points of departure for further research in this regard. Furthermore, the thesis contributes to theoretically-oriented research in the Nordic countries through applying the theory of sensation seeking on data collected at a natural area near the Norwegian city of Stavanger and by pointing out some particularities of the Norwegian context in the findings (Fredman & Tyrväinen, 2010, pp. 181-183). Nevertheless, even though this study was conducted in Norway, the conceptual model was aligned at natural areas in general and might therewith also be applicable in other contexts, although adjustments are necessary considering the limitations pointed out previously.

For the managerial implications, it is examined how the findings of the thesis can contribute to solve the challenge natural areas are facing, that was initially outlined as the motivation for the thesis, namely how to combine access to natural areas for recreation with the protection of nature and how to conduct nature-based tourism in a sustainable way in this regard. In order to solve this empirical problem, the importance of understanding visitors to nature areas was outlined (Eagles, 2007, p. 38; Galloway, 2002, p. 581). It was found that sensation seeking is significantly related to the *physical* motive of preference for stimulating and/or challenging activities, the *wildlife* motives and the *focus on self* motive of having time to reflect on life. These findings could be used for the marketing of nature areas, meaning that the motives that are important for high sensation seekers are highlighted in the advertising directed at that segment, considering that literature on how to effectively advertise to people of a given personality type is available (Galloway & Lopez, 1999, p. 670). Here a segmentation of the market according to sensation seeking might be feasible considering that “segment-oriented visitor information may better reach visitors” (Sievänen et al., 2011, pp. 68-69). The enhanced marketing could then be applied to convince high and low sensation seekers of the benefits of being outdoors as well as for the participation in the environmental

protection of the area, for example through waste-collecting excursions (Musgrave & Dávid, 2011, p. 214).

Regarding the natural area management, it was found that sensation seeking is significantly related to only one of the attitudes to the management of the *facilities*, namely the preference for eating in untouched areas, indicating that higher sensation seekers are less likely to use facilities and instead venture out in the nature for picknick places. This implies that this personality segment might require further information on the sustainability of the destination usage and about how to behave ecologically responsible when eating in untouched areas than lower sensation seekers who are correspondingly more likely to eat in the designated areas. In addition, the relation between sensation seeking and the *wildlife* motives to visit natural areas might indicate the necessity to especially inform this personality segment about the possible disturbances to wildlife resulting from humans in nature areas and the corresponding guidelines of how to behave responsibly (Newsome et al., 2002, p. 73). Consequently, segmenting visitors to natural areas according to sensation seeking seems to have potential to enhance the management of natural areas (Galloway & Lopez, 1999, p. 665), and might be useful to improve the sustainability of the destination usage (Galloway, 2002, p. 581).

Furthermore, the collected data showed that on average respondents were neutral with regard to the statement that off-trail hiking has a negative impact on nature (mean = 2.85, see Table C1), indicating the need to increase awareness about these negative impacts in order to foster environmentally responsible behaviour (Kil et al., 2014, p. 16). This should be achieved by combining information and regulation as outlined in the literature review, even though the respondents on average agreed with the regulatory measures with the exception of the charging of fees (see Table C1), corresponding with the Norwegian tradition of open access to nature on either private or public land (Denstadli et al., 2010, p. 369), which managers of

natural areas in Norway should be especially aware of. The support of the regulatory measures therewith contradicts previous findings that visitors may not recognize the benefits of management actions to minimize negative ecological impacts (Denstadli et al., 2010, p. 369), and instead shows on average a willingness to accept these measures for the sake of the environment. It is also consistent with the average agreement with the placement of boardwalks over marshy areas (mean = 4.00, see Table C1), which might indicate an awareness by the respondents of the ecological benefits of these (Denstadli et al., 2010, p. 369). As a consequence, although more information about the protection of nature might be necessary to foster environmentally responsible behaviour, especially of higher sensation seekers as outlined above, there seems to be willingness to accept regulatory measures in order to protect nature. Even though, the average responses only give information on the level of agreement and further research would be necessary to identify the reasons for these levels, considering the limited number of statistically significant regression coefficients for these items found in this study (see Table E3). Nevertheless, these considerations have practical relevance for the management of nature areas and indicate potential measures to combine access for recreation and the protection of nature in a sustainable way. Increasing the classification of rural areas as national parks would therefore be beneficial, as it provides more opportunities for site and visitor management including regulating human activities to minimize the impact on nature resources, therewith protecting nature and maintaining it for future generations (Musgrave & Dávid, 2011, p. 212; Newsome et al., 2002, p. 185; Papageorgiou, 2001, pp. 61-62). This is especially important with regard to the growth in nature-based tourism (Balmford et al., 2009, p. 1; Buckley, 2000, p. 442; Cohen, E., 2008, p. 332), which might also make the foundation of more national parks even more likely, considering that tourism can often provide an incentive for protecting biodiversity-rich areas (Balmford et al., 2009, p. 4; Gössling, 1999, p. 303).

### **Recommendations for Future Research**

Considering the relevance of the implications of research in the natural area context, further research is necessary. With regard to the findings of this thesis, further research on the items that showed low reliability and validity, namely the *escape* motive and the attitudes to the management of *information* and *protection of nature* in natural areas, would be interesting in order to assess the reasons why the items apparently did not indicate the same construct to the respondents and if this can be explained by an underdevelopment of the concepts or might be due to contextual factors. Especially, the *escape* motive in the Norwegian context presents a potential point of departure for further research, aiming at examining how escape is achieved and how important it is that the area offers something new, considering the extent to which Norwegians spend time in the outdoors, the so called friluftsliv, and with hiking being an important part of outdoor activities (Svarstad, 2010, p. 92). Furthermore, research on the constructs for which a relationship direction was not predicted, due to the lack of previous research on sensation seeking with regard to those constructs, is necessary in order to possibly find confirmation for the direction of the relationship with sensation seeking calculated in this thesis, considering that only for the *focus on self* item a significant correlation was identified. Therefore, further research is necessary on the relationship between sensation seeking and the attitudes to *facilities*, *protection of nature* and *regulation of visitors*. Especially since the respondents on average have no particular preferences for information and agree with the regulatory measures (see Table C1), even though previous studies found that indirect methods like provision of information were preferred over direct methods like regulations and fees (Denstadli et al., 2010, pp. 368-369), supports the need for further research on the attitudes to management in natural areas and how this relates to sensation seeking. In addition, the motives and attitudes to management for which significant relationships with sensation seeking were identified, provide potential for further research in order to find support for

these findings in the context of for example other natural areas, specifically with regard to the *wildlife* and *focus on self* motive due to good reliability and validity findings of these constructs. In general, a replication with possible modifications to the conceptual model and further developed, more unidimensional concepts and measures that contain multiple items with less uniqueness, with a random sample in the summer season is recommended in order to, on the one hand be able to calculate the relationship between the total sensation seeking score and the score of multi-item measures for the motives and attitudes to management, and on the other hand to achieve a larger and more representative sample, therewith aiming at more reliable, valid and generalizable findings. This would also address the previously outlined limitations with regard to the reliability and validity of the thesis, including statistical conclusion and external validity.

Nationality made a statistically significant contribution to the prediction of several items in the multiple regression analysis, therefore nationality might also provide potential for further research by examining the utility of nationality differences in explaining motives and attitudes to management in natural areas, even though it must be considered that the sampling in this thesis limited the generalizability of the findings concerning the sociodemographic characteristics. Nevertheless, a specific research topic in this regard could be the examination of the impact of nationality on attitudes to protection of nature and regulation of visitors in natural areas, considering the negative standardized coefficients Beta for the *protection of nature* items and *regulation of visitor* items of nationality (see Table E3), even though previous studies found Norwegians to be rather environmental-conscious (Bjerke et al., 2006, p. 125), and against the backdrop of the Right of Public Access in the Scandinavian context (Fredman & Tyrväinen, 2010, p. 179). This also corresponds with the recommendation by Tangeland et al. (2013) to develop a better understanding of the domestic market, meaning of



Norwegian tourists, which could contribute to an economically more sustainable development of nature-based tourism in Norway (p. 191).

Moreover, the previously mentioned possible distinctions and comparisons with other personality theories in order to identify possible alternative causes of the results and thereby improving the understanding of visitor motives and attitudes to management provides research potential. Generally, identifying possible alternative causes of differences in motives and attitudes to management in natural areas and revising the conceptual model accordingly would provide research potential in order to establish if a causal explanation of differences in motives and attitudes to management in natural areas with sensation seeking is possible (Neuman, 2014, p. 221). In this regard, experimental research is recommended as it allows more certainty whether a discovered relationship denotes a causal relationship and therewith has higher internal validity (Bryman & Bell, 2003, pp. 48-49; Neuman, 2014, p. 221). Finally, further research on the differences between national parks and natural areas, for example by conducting research on the effects of these words in questionnaires or by comparing the responses of participants sampled in national parks and natural areas nearby urban areas, might provide insights in how visitors' motives and attitudes to management differ in national parks and nearby natural areas, which could have relevant implications for the marketing and management of national parks and nature areas.

Consequently, there are several potential points of departure for further research that can be derived from this thesis, especially with regard to the further development of the possible effects of sensation seeking in natural areas. After discussing the findings of this thesis, its limitations, possible methodological, theoretical and managerial implications and the recommended future research directions, the subsequent conclusion provides an overall summary of the thesis.

### **Conclusion**

This thesis aimed at examining the utility of the personality variable sensation seeking in explaining differences in motives and attitudes to management in natural areas in order to address the empirical problem of the challenge natural areas are facing, namely how to combine the access to nature areas for recreation purposes with the protection of the natural environment as outlined in the introduction. Whereas there is extensive research on the sensation seeking theory and on nature-based tourism, there is only limited research applying the sensation seeking construct in the context of nature-based tourism, as it became clear in the literature review. Through the development of the conceptual model that analysed the relationship between sensation seeking as the explanatory variable and the motives and attitudes to management in natural areas, the aim was to contribute to fill this research gap and thereby to gain further understanding of visitors to natural areas in order to address the empirical problem. As the study was conducted in a natural area in Norway, the thesis also contributed to theoretically-oriented research in the Nordic countries.

The results of testing the conceptual model through a quantitative research design in form of a survey with data collected at a natural area near the city of Stavanger, that offers outdoor recreation opportunities for high and low sensation seekers to ensure a variety of sensation seeking scores in the sample, showed, however, that only for some items of the motives and attitudes to natural area management significant relationships with the total sensation seeking score were identified. Possible reasons for this apparent limited utility of sensation seeking in explaining motives and attitudes to management in natural areas might be the limitations of the study, especially the underdeveloped measures for the motive and attitude concepts and the resulting analysis on the item level, that were discussed previously in more detail. Consequently, further research is necessary to make more conclusive statements regarding the utility of sensation seeking in understanding visitors to nature areas.

This is also supported by the good reliability and validity that was found for the BSSS measuring sensation seeking with the sample of natural area visitors, which therefore seems to be an applicable measure in the nature-based tourism context.

Even though the number of statistically significant relationships between sensation seeking and the motive and attitude to management items was limited, the thesis still contributed to the research on applying personality variables in the context of nature-based tourism and presented possible points of departure for further research. Conducting further research on the utility of personality theories like sensation seeking in order to understand visitors to natural areas, their motives and attitudes to management is especially important considering the current developments that were previously outlined. These developments include several trends and external factors influencing nature-based tourism that lead to the growth of nature-based tourism, which is on the one hand a positive development as spending time in nature contributes to physical and mental well-being and is therewith beneficial for the human, but increasing visits to natural areas can on the other hand also cause damages to the environment, which has not only negative impacts on nature but can also negatively affect us humans if the natural environment is destroyed to an extent where future generations cannot benefit from the positive aspects of nature anymore. It is therefore necessary to conduct nature-based tourism in a sustainable way, for the benefit of future generations but above all for the sake of nature itself. It was therefore also the aim of this thesis to question our own motives why we visit nature and our own attitudes to the management of nature areas in order to encourage reflecting on our own ways of how we behave in nature and thereby to raise awareness of these aspects of outdoor recreation and tourism and to foster environmentally responsible behaviour.

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**Appendix A**  
**Construct Items**

Table A1

*Brief Sensation Seeking Scale*

Item
Experience Seeking I would like to explore strange places. I would like to take off on a trip with no pre-planned routes or timetables.
Boredom Susceptibility I get restless when I spend too much time at home. I prefer friends who are excitingly unpredictable.
Thrill and Adventure Seeking I like to do frightening things. I would like to try bungee jumping.
Disinhibition I like wild parties. I would love to have new and exciting experiences, even if they are illegal.

*Note:* Adapted from “Reliability and validity of a brief measure of sensation seeking” by R. H. Hoyle, M. T. Stephenson, P. Palmgreen, E.P. Lorch and R. L. Donohew, 2002, *Personality and Individual Differences*, 32(3), p. 405. doi: 10.1016/S0191-8869(01)00032-0

Table A2

*Motives and Attitudes to Management in Natural Areas*

Item	Predicted relationship	Source
Motives		
Social I like visiting nature and meeting interesting people there particularly those who share my interest.	Positive	Galloway & Lopez, 1999, p. 666
I enjoy visiting natural areas because it gives me the opportunity to spend time with family and friends.	Negative	Galloway & Lopez, 1999, p. 666
Escape I am likely to revisit natural settings where I enjoyed myself even if I expect nothing new in terms of stimulation and/or activities.	Negative	Galloway & Lopez, 1999, p. 666

I am reluctant to visit natural areas which are remote.	Negative	Galloway & Lopez, 1999, p. 666
<b>Physical</b>		
I feel dissatisfied with my experience at a natural setting where there are no opportunities to enjoy pleasant scenery such as the countryside, mountains, lakes, waterfalls, etc.	Positive	Galloway & Lopez, 1999, p. 666
I prefer to visit nature areas which offer the opportunity to engage in activities which I find stimulating and/or challenging.	Positive	Galloway & Lopez, 1999, p. 666
<b>Wildlife</b>		
I stay away from areas in nature where I am likely to encounter potentially dangerous native animals.	Negative	Galloway & Lopez, 1999, p. 666
Rather than observe the local wildlife that gathers around visitors I prefer actively to seek and interact with other types of animals which populate these areas.	Positive	Galloway & Lopez, 1999, p. 666
<b>Focus on self</b>		
I like visiting nature to have time to reflect on life.	?	Garms et al., 2017, p. 248
I enjoy visiting natural areas because it gives me the opportunity to find inspiration in natural surroundings.	?	Garms et al., 2017, p. 248
<b>Attitudes to natural area management</b>		
<b>Information</b>		
I have no particular preferences about the kind of information I would like to receive in a natural area.	Negative	Galloway & Lopez, 1999, p. 666
I prefer to engage in structured outdoor tours rather than taking a self-guided tour.	Negative	Galloway & Lopez, 1999, p. 666
<b>Facilities</b>		
I like eating in areas of nature which are untouched rather than using designated areas.	Positive	Galloway & Lopez, 1999, p. 666
I dislike primitive facilities at natural settings.	Negative	Galloway & Lopez, 1999, p. 666
I would prefer more and better signposting.	?	Haukeland et al., 2010, p. 259

I think the placement of boardwalks over marshy areas is a good idea.	?	Denstadli et al., 2010, p. 368
<b>Protection of nature</b>		
Nature conservation should have the highest priority of all land uses in natural areas.	?	Arnberger et al., 2012, p. 52
Off-trail hiking has a negative impact on wild-life and plants.	?	Arnberger et al., 2012, p. 52
<b>Regulation of visitors</b>		
In my opinion visitor rules are necessary in a natural setting to provide a positive visitor experience.	?	Arnberger et al., 2012, p. 52
The management of nature areas should limit recreation use if the natural environment is threatened.	?	Huang et al., 2008, p. 71
I would support the management decision to close damaged areas of the natural area.	?	Denstadli et al., 2010, p. 368
I would support the management decision to charge fees for using the natural area.	?	Denstadli et al., 2010, p. 368

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## Appendix B

### Questionnaire

#### Why do you visit nature and what are your attitudes to management in natural areas?

Dear Participant,

I invite you to participate in this research study aimed at understanding visitors to natural areas. I am currently enrolled in the Master of International Hospitality Management at the University of Stavanger and am in the process of writing my Master's Thesis. The purpose of the research is to apply a personality variable to explain motives and attitudes to management in natural areas.

The enclosed questionnaire has been designed to collect information on: motives, attitudes, general characteristics and some sociodemographic information. The statements refer to natural areas in general. There is no correct nor wrong answers to the questions, instead we are interested in your personal experiences and opinions.

Your responses will remain confidential and anonymous. Data from this research will be kept under lock and key and reported only as a collective combined total. Your participation in this research project is completely voluntary. You may decline altogether, or leave blank any questions you do not wish to answer. There are no known risks to participation beyond those encountered in everyday life.

If you agree to participate in this project, please answer the questions on the questionnaire as best you can. It should take approximately 5 minutes to complete.

If you have any questions about this project, feel free to contact me on phone +4915152594622 or on email [kranzcarlotta@web.de](mailto:kranzcarlotta@web.de) or my supervisor Torvald Øgaard (phone: +4751831597, email: [torvald.ogaard@uis.no](mailto:torvald.ogaard@uis.no)). More information on your rights are available at the NSD – The Norwegian Centre for Research Data (phone: +4755582117, email: [personverntjenester@nsd.no](mailto:personverntjenester@nsd.no)).

Thank you for taking the time to assist me in my educational endeavors.

Sincerely yours,

Lea Carlotta Kranz

1. I confirm that I have read and understand the information sheet for the above study and have had the opportunity to ask questions.
2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving reason.
3. I agree to take part in the above study.

Please respond to the following statements with a tick in the relevant box.

<b>Extent of agreement with the following statements about motives for visiting natural areas:</b>	Strongly disagree <b>1</b>	<b>2</b>	Neutral <b>3</b>	<b>4</b>	Strongly agree <b>5</b>
I like visiting nature and meeting interesting people there particularly those who share my interest. (particularly = specifically)					
I enjoy visiting natural areas because it gives me the opportunity to spend time with family and friends.					
I am likely to revisit natural settings where I enjoyed myself even if I expect nothing new in terms of stimulation and/or activities.					
I am reluctant to visit natural areas which are remote. (reluctant = unwilling, hesitant)					
I feel dissatisfied with my experience at a natural setting where there are no opportunities to enjoy pleasant scenery such as the countryside, mountains, lakes, waterfalls, etc.					
I prefer to visit nature areas which offer the opportunity to engage in activities which I find stimulating and/or challenging.					
I stay away from areas in nature where I am likely to encounter potentially dangerous native animals.					
Rather than observe the local wildlife that gathers around visitors I prefer actively to seek and interact with other types of animals which populate these areas.					
I like visiting nature to have time to reflect on life.					
I enjoy visiting natural areas because it gives me the opportunity to find inspiration in natural surroundings.					
<b>Extent of agreement with the following statements about natural area management:</b>	Strongly disagree <b>1</b>	<b>2</b>	Neutral <b>3</b>	<b>4</b>	Strongly agree <b>5</b>
I have no particular preferences about the kind of information I would like to receive in a natural area. (particular = specific)					
I prefer to engage in structured outdoor tours rather than taking a self-guided tour.					
I like eating in areas of nature which are untouched rather than using designated areas.					
I dislike primitive facilities at natural settings.					
I prefer more and better signposting.					
I think the placement of boardwalks over marshy areas is a good idea.					

Nature conservation should have the highest priority of all land uses in natural areas.					
Off-trail hiking has a negative impact on wildlife and plants.					
In my opinion visitor rules are necessary in a natural setting to provide a positive visitor experience.					
The management of nature areas should limit recreation use if the natural environment is threatened.					
I would support the management decision to close damaged areas of the natural area.					
I would support the management decision to charge fees for using the natural area.					
<b>Extent of agreement with the following general statements:</b>	Strongly disagree <b>1</b>	<b>2</b>	Neutral <b>3</b>	<b>4</b>	Strongly agree <b>5</b>
I would like to explore strange places.					
I would like to take off on a trip with no pre-planned routes or timetables.					
I get restless when I spend too much time at home.					
I prefer friends who are excitingly unpredictable.					
I like to do frightening things.					
I would like to try bungee jumping.					
I like wild parties.					
I would love to have new and exciting experiences, even if they are illegal.					

**Finally, please answer some general questions:**

What is your gender? Female Male Other

What is your age? \_\_\_\_\_

What is your nationality? \_\_\_\_\_

How would you describe your experience with any of the possible outdoor activities in this nature area, for example hiking?

Novice Lower Intermediate Intermediate Advanced

**Thank you very much for your participation!**

## Appendix C

### Description of Collected Data

Table C1

#### *Descriptive Statistics of Collected Data*

Item	Mean	Std. deviation	Skewness	Kurtosis
Motive_S1: I like visiting nature and meeting interesting people there particularly those who share my interest.	4.16	.91	-.86	.12
Motive_S2: I enjoy visiting natural areas because it gives me the opportunity to spend time with family and friends.	4.43	.80	-1.33	1.05
Motive_E1: I am likely to revisit natural settings where I enjoyed myself even if I expect nothing new in terms of stimulation and/or activities.	4.54	.74	-1.87	4.13
Motive_E2: I am reluctant to visit natural areas which are remote.	2.28	1.20	.53	-.74
Motive_P1: I feel dissatisfied with my experience at a natural setting where there are no opportunities to enjoy pleasant scenery such as the countryside, mountains, lakes, waterfalls, etc.	2.97	1.19	.03	-.78
Motive_P2: I prefer to visit nature areas which offer the opportunity to engage in activities which I find stimulating and/or challenging.	3.32	1.04	-.01	-.55
Motive_W1: I stay away from areas in nature where I am likely to encounter potentially dangerous native animals.	2.98	1.22	.13	-1.03
Motive_W2: Rather than observe the local wildlife that gathers around visitors I prefer actively to seek and interact with other types of animals which populate these areas.	2.88	1.00	-.12	-.23



Motive_F1: I like visiting nature to have time to reflect on life.	4.35	.94	-1.44	1.31
Motive_F2: I enjoy visiting natural areas because it gives me the opportunity to find inspiration in natural surroundings.	4.38	.87	-1.50	1.92
Attitude_I1: I have no particular preferences about the kind of information I would like to receive in a natural area.	3.22	1.01	-.06	-.02
Attitude_I2: I prefer to engage in structured outdoor tours rather than taking a self-guided tour.	2.02	1.22	1.12	.28
Attitude_F1: I like eating in areas of nature which are untouched rather than using designated areas.	3.87	1.00	-.63	.21
Attitude_F2: I dislike primitive facilities at natural settings.	2.25	1.17	.57	-.63
Attitude_F3: I would prefer more and better signposting.	3.36	1.07	-.17	-.40
Attitude_F4: I think the placement of boardwalks over marshy areas is a good idea.	4.00	.95	-.61	-.39
Attitude_PN1: Nature conservation should have the highest priority of all land uses in natural areas.	4.17	.91	-.82	-.05
Attitude_PN2: Off-trail hiking has a negative impact on wild-life and plants.	2.85	1.00	-.01	-.52
Attitude_RV1: In my opinion visitor rules are necessary in a natural setting to provide a positive visitor experience.	3.99	.86	-.35	-.79
Attitude_RV2: The management of nature areas should limit recreation use if the natural environment is threatened.	4.01	.97	-.88	.49
Attitude_RV3: I would support the management decision to close damaged areas of the natural area.	4.15	1.06	-1.25	.97

Attitude_RV4: I would support the management decision to charge fees for using the natural area.	2.52	1.45	.37	-1.30
SensationS_ES1: I would like to explore strange places.	4.46	.78	-1.69	3.26
SensationS_ES2: I would like to take off on a trip with no pre-planned routes or timetables.	3.66	1.29	-.54	-.97
SensationS_BS1: I get restless when I spend too much time at home.	4.09	1.02	-.96	.14
SensationS_BS2: I prefer friends who are excitingly unpredictable.	3.36	1.07	-.29	-.30
SensationS_TAS1: I like to do frightening things.	2.66	1.24	.12	-1.14
SensationS_TAS2: I would like to try bungee jumping.	2.37	1.49	.62	-1.10
SensationS_D1: I like wild parties.	2.70	1.41	.25	-1.21
SensationS_D2: I would love to have new and exciting experiences, even if they are illegal.	1.94	1.24	1.16	.20

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**Appendix D****Examination of the Quality of the Collected Data**

Table D1

*Reliability of the BSSS*

Item	Corrected item-total correlation	Cronbach's alpha if item deleted
SensationS_ES1	.36	.71
SensationS_ES2	.33	.72
SensationS_BS1	.24	.73
SensationS_BS2	.41	.70
SensationS_TAS1	.66	.65
SensationS_TAS2	.46	.69
SensationS_D1	.45	.69
SensationS_D2	.48	.69

Table D2

*Reliability of the Motive and Attitude to Management Concepts*

Concept	Number of items	Mean inter-item correlation
<b>Motives</b>		
Social	2	.39
Escape	2	-.17
Physical	2	.02
Wildlife	2 (1 recoded)	.13
Focus on self	2	.46
<b>Attitudes to management</b>		
Information	2 (1 recoded)	-.03
Facilities	4 (1 recoded)	.10
Protection of nature	2	-.05
Regulation of visitors	4	.27

Table D3

*Correlation Matrix for Motive Items*

Item	Motive_S1	Motive_S2	Motive_E1	Motive_E2	Motive_P1	Motive_P2	Motive_W1_ recoded	Motive_W2	Motive_F1	Motive_F2
Motive_S1	-									
Motive_S2	.39**	-								
Motive_E1	-.01	.12	-							
Motive_E2	-.04	-.01	-.17*	-						
Motive_P1	-.23**	-.05	-.05	.16	-					
Motive_P2	.02	.11	.03	.08	.02	-				
Motive_W1_recoded	.03	-.07	.08	-.06	-.07	-.10	-			
Motive_W2	.08	.08	.14	-.10	-.11	.08	.13	-		
Motive_F1	.04	.12	.12	-.09	-.09	-.03	.13	.09	-	
Motive_F2	.06	.08	.13	-.10	.00	-.02	.05	.12	.46**	-
Attitude_I1_recoded	.10	.08	.00	-.04	-.03	.00	.06	-.01	.07	.11
Attitude_I2	.14	.05	-.22**	.19*	-.01	.16*	-.25**	-.07	-.08	-.21*
Attitude_F1_recoded	-.06	-.03	-.04	.05	-.20*	.05	.18*	-.06	.03	-.10
Attitude_F2_	-.13	.10	-.24**	.13	.11	-.02	-.15	.05	-.03	.04
Attitude_F3	.04	.01	.01	.08	.06	.13	-.36**	-.07	-.04	-.07
Attitude_F4	.06	-.11	.01	.01	-.07	.03	-.16*	-.13	.05	-.02
Attitude_PN1	-.02	.02	.15	-.10	.04	.05	-.10	-.04	-.02	.07
Attitude_PN2	.09	-.01	-.12	.11	.01	.18*	-.14	-.18*	-.08	-.15
Attitude_RV1	.11	.04	.06	.11	.05	.18*	-.01	-.15	-.11	-.04
Attitude_RV2	.02	.05	.17*	-.05	-.03	-.01	-.05	-.01	.04	-.04
Attitude_RV3	.17*	.05	.10	-.02	-.07	.01	-.01	.07	.02	.00
Attitude_RV4	.07	.12	-.06	.04	-.10	.05	-.11	.04	-.01	-.04
SensationS_ES1	.13	.09	.17*	-.05	-.02	.03	.26**	.27**	.16*	.24**
SensationS_ES2	-.04	-.01	.18*	-.07	-.08	.06	.22**	.04	.12	.21*
SensationS_BS1	.11	.16*	-.01	.04	.13	.02	.15	.00	.38**	.31**

SensationS_BS2	.17*	.16*	.03	.05	-.01	.03	-.02	.12	.09	.17*
SensationS_TAS1	.15	.15	.06	.00	.00	.15	.28**	.25**	.09	.03
SensationS_TAS2	.14	.09	-.09	.03	-.06	.16*	.28**	.15	.10	-.06
SensationS_D1	.01	-.05	.02	.04	.02	.19*	.13	.12	.04	-.14
SensationS_D2	-.02	-.11	-.07	.05	.20*	.22**	.17*	.03	-.03	-.05

Note: Filled cells signal correlations between items of the same construct.

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

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

Table D4

*Correlation Matrix for Attitude to Management Items*

Item	Attitude_I1_recoded	Attitude_I2	Attitude_F1_recoded	Attitude_F2	Attitude_F3	Attitude_F4	Attitude_PN1	Attitude_PN2	Attitude_RV1	Attitude_RV2	Attitude_RV3	Attitude_RV4
Motive_S1	.10	.14	-.06	-.13	.04	.06	-.02	.09	.11	.02	.17*	.07
Motive_S2	.08	.05	-.03	.10	.01	-.11	.02	-.01	.04	.05	.05	.12
Motive_E1	-.00	-.22**	-.04	-.24**	.01	.01	.15	-.12	.06	.17*	.10	-.06
Motive_E2	-.04	.19*	.05	.13	.08	.01	-.10	.11	.11	-.05	-.02	.04
Motive_P1	-.03	-.01	-.20*	.11	.06	-.07	.04	.01	.05	-.03	-.07	-.10
Motive_P2	-.00	.16*	.05	-.02	.13	.03	.05	.18*	.18*	-.01	.01	.05
Motive_W1_recoded	-.06	-.25**	-.18*	-.15	-.36**	-.16*	-.10	-.14	-.01	-.05	-.01	-.11
Motive_W2	-.01	-.07	-.06	.05	-.07	-.13	-.04	-.18*	-.15	-.01	.07	.04
Motive_F1	.07	-.08	.03	-.03	-.04	.05	-.02	-.08	-.11	.04	.02	-.01
Motive_F2	.11	-.21*	-.10	.04	-.07	-.02	.07	-.15	-.04	-.04	.00	-.04
Attitude_I1_recoded	-											
Attitude_I2	-.03	-										
Attitude_F1_recoded	-.02	-.01	-									
Attitude_F2	-.02	.14	-.04	-								
Attitude_F3	.01	.23**	.10	.16*	-							
Attitude_F4	-.09	.10	.13	-.10	.33**	-						

Attitude_PN1	-.06	-.03	-.09	.02	.22**	.18*	-					
Attitude_PN2	.01	.23**	.02	.04	.07	.03	-.05	-				
Attitude_RV1	.09	.19*	.01	-.06	.29**	.24**	.25**	.17*	-			
Attitude_RV2	.02	-.12	.07	-.12	.25**	.24**	.32**	.13	.41**	-		
Attitude_RV3	-.06	.05	-.01	-.21*	.16	.18*	.27**	.14	.34**	.66**	-	
Attitude_RV4	.04	.18*	.15	.06	.17*	-.09	-.05	.15	.13	.03	.05	-
SensationS_ES1	-.02	-.19*	-.28**	-.07	-.24**	-.12	.27**	-.07	.03	.07	.21*	-.04
SensationS_ES2	-.09	-.14	-.16*	-.02	-.14	-.08	.18*	-.07	.02	.01	.07	-.02
SensationS_BS1	-.04	-.17*	-.14	-.03	-.06	.08	.11	-.03	-.02	.02	.03	-.01
SensationS_BS2	-.11	.09	-.01	.09	.10	-.01	.08	.04	.07	.01	.13	.00
SensationS_TAS1	-.08	-.03	-.10	.09	-.06	-.03	.08	-.02	.06	.13	.08	-.04
SensationS_TAS2	-.03	.10	-.22**	.12	-.06	-.01	.01	.01	.01	.04	-.05	-.04
SensationS_D1	-.06	.05	-.05	.03	.08	-.03	-.08	-.02	.05	.07	.00	-.02
SensationS_D2	-.12	.09	-.20*	.13	.04	-.11	-.10	-.08	.07	.01	.00	-.02

Note: Filled cells signal correlations between items of the same construct.

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

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

Table D5

*Correlation Matrix for Sensation Seeking Items*

Item	Sensations_ES1	Sensations_ES2	Sensations_BS1	Sensations_BS2	Sensations_TAS1	Sensations_TAS2	Sensations_D1	Sensations_D2
Motive_S1	.13	-.04	.11	.17*	.15	.14	.01	-.02
Motive_S2	.09	-.01	.16*	.16*	.15	.09	-.05	-.11
Motive_E1	.17*	.18*	-.01	.03	.06	-.09	.02	-.07
Motive_E2	-.05	-.07	.04	.05	.00	.03	.04	.05
Motive_P1	-.02	-.08	.13	-.01	.00	-.06	.02	.20*
Motive_P2	.03	.06	.02	.03	.15	.16*	.19*	.22**
Motive_W1_recoded	.26**	.22**	.15	-.02	.28**	.28**	.13	.17*

Motive_W2	.27**	.04	.00	.12	.25**	.15	.12	.03
Motive_F1	.16*	.12	.38**	.09	.09	.10	.04	-.03
Motive_F2	.24**	.21*	.31**	.17*	.03	-.06	-.14	-.05
Attitude_I1_recoded	-.02	-.09	-.04	-.11	-.08	-.03	-.06	-.12
Attitude_I2	-.19*	-.14	-.17*	.09	-.03	.10	.05	.09
Attitude_F1_recoded	-.28**	-.16*	-.14	-.01	-.10	-.22**	-.05	-.20*
Attitude_F2	-.07	-.02	-.03	.09	.09	.12	.03	.13
Attitude_F3	-.24**	-.14	-.06	.10	-.06	-.06	.08	.04
Attitude_F4	-.12	-.08	.08	-.01	-.03	-.01	-.03	-.11
Attitude_PN1	.27**	.18*	.11	.08	.08	.01	-.08	-.10
Attitude_PN2	-.07	-.07	-.03	.04	-.02	.01	-.02	-.08
Attitude_RV1	.03	.02	-.02	.07	.06	.01	.05	.07
Attitude_RV2	.07	.01	.02	.01	.13	.04	.07	.01
Attitude_RV3	.21*	.07	.03	.13	.08	-.05	.00	.00
Attitude_RV4	-.04	-.02	-.01	.00	-.04	-.04	-.02	-.02
SensationS_ES1	-							
SensationS_ES2	.40**	-						
SensationS_BS1	.23**	.32**	-					
SensationS_BS2	.27**	.25**	.24**	-				
SensationS_TAS1	.27**	.29**	.22**	.42**	-			
SensationS_TAS2	.12	.10	.05	.15	.62**	-		
SensationS_D1	.15	.07	.02	.23**	.38**	.37**	-	
SensationS_D2	.15	.13	.06	.20*	.34**	.39**	.56**	-

Note: Filled cells signal correlations between items of the same construct.

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

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

Table D6

*Pattern and Structure Matrix for Principal Components Analysis (PCA) with Oblimin*

*Rotation of Five Factor Solution of Motive Items*

Item	Pattern coefficients					Structure coefficients				
	Component					Component				
	1	2	3	4	5	1	2	3	4	5
Motive_F2	<b>.84</b>	-.00	-.05	-.04	-.02	.84	.04	-.14	.04	.04
Motive_F1	<b>.82</b>	.06	.00	-.09	.11	.82	.10	-.11	-.03	.16
Motive_S1	.01	<b>.86</b>	.12	-.04	.04	.03	.85	.01	-.02	.08
Motive_S2	.17	<b>.69</b>	.01	.28	-.23	.21	.69	-.05	.32	-.19
Motive_P1	.15	<b>-.48</b>	.27	.24	-.25	.11	-.51	.34	.25	-.34
Motive_E2	.00	-.03	<b>.79</b>	.25	.10	-.06	-.10	.78	.24	-.09
Motive_E1	.12	-.10	<b>-.67</b>	.30	-.01	.21	-.01	-.68	.32	.09
Motive_P2	-.10	.05	.06	<b>.79</b>	-.04	-.04	.06	.06	.78	-.11
Motive_W1_recoded	.10	-.06	.14	-.11	<b>.83</b>	.11	-.02	.00	-.16	.81
Motive_W2	.02	.06	-.18	<b>.46</b>	<b>.59</b>	.1	.13	-.30	.43	.59
Explained variance in %	18.59	13.88	11.95	10.74	9.79					
Cumulative variance in %	18.59	32.47	44.41	55.16	64.94					

*Note:* Factor loadings > .30 are in boldface.  
 Extraction Method: Principal Component Analysis.  
 Rotation Method: Oblimin with Kaiser Normalization.

Table D7

*Pattern and Structure Matrix for PCA with Oblimin Rotation of Four Factor Solution of*

*Sensation Seeking Items*

Item	Pattern coefficients				Structure coefficients			
	Component				Component			
	1	2	3	4	1	2	3	4
SensationS_TAS2	<b>.95</b>	-.04	.03	-.15	.92	.10	.41	.05
SensationS_TAS1	<b>.81</b>	.08	.01	.22	.88	.32	.38	.43
SensationS_ES1	-.04	<b>.86</b>	.13	-.07	.17	.84	.19	.25



SensationS_ES2	.07	<b>.78</b>	-.08	.09	.21	.82	.03	.38
SensationS_D1	.03	-.02	<b>.86</b>	.05	.40	.09	.88	.15
SensationS_D2	.03	.09	<b>.84</b>	-.01	.40	.17	.86	.12
SensationS_BS2	.03	-.09	.21	<b>.81</b>	.28	.24	.30	.81
SensationS_BS1	-.01	.15	-.17	<b>.71</b>	.11	.39	-.08	.74
Explained variance in %	35.31	18.71	10.55	9.69				
Cumulative variance in %	35.51	54.02	64.58	74.27				

*Note:* Factor loadings > .30 are in boldface  
 Extraction Method: Principal Component Analysis.  
 Rotation Method: Oblimin with Kaiser Normalization.

Table D8

*Component Matrix for PCA of Single Factor Solution of Sensation Seeking Items*

Item	Component 1
SensationS_TAS1	<b>.80</b>
SensationS_TAS2	<b>.65</b>
SensationS_D2	<b>.64</b>
SensationS_D1	<b>.63</b>
SensationS_BS2	<b>.58</b>
SensationS_ES1	<b>.50</b>
SensationS_ES2	<b>.49</b>
SensationS_BS1	<b>.37</b>
Explained variance in %	35.31

*Note:* Factor loadings > .30 are in boldface.  
 Extraction Method: Principal Component Analysis.

Figure D1

Scree Plot of Exploratory Factor Analysis of Motive Items

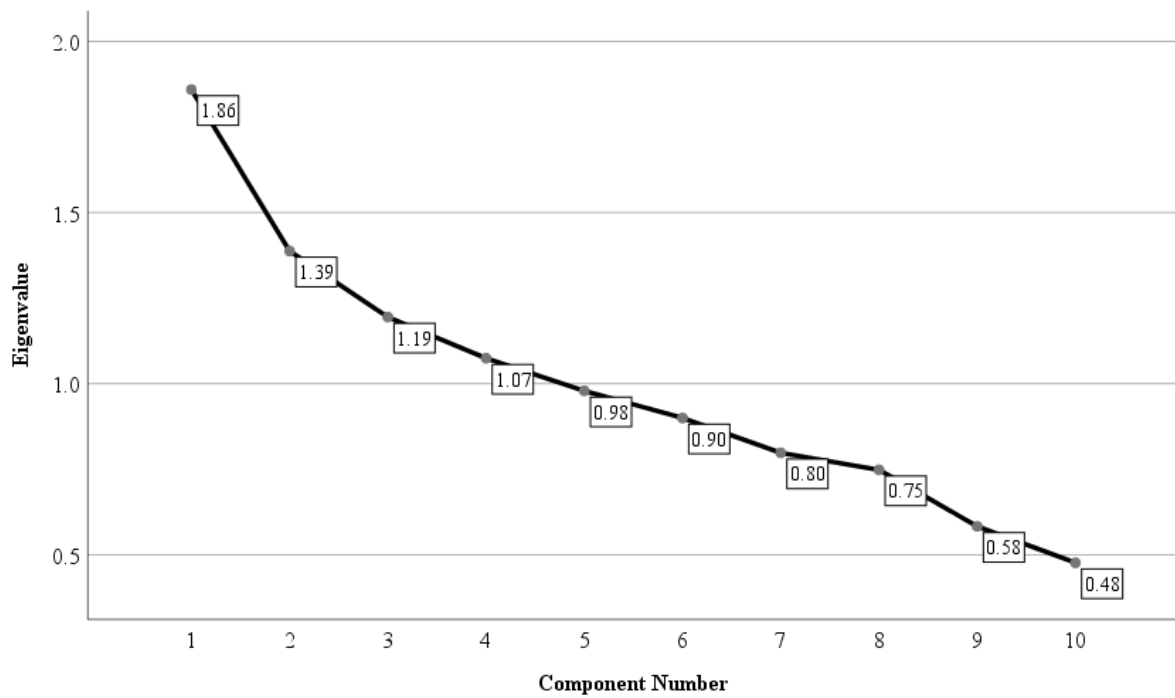


Table D9

Pattern Matrix for PCA with Oblimin Rotation of Exploratory Factor Analysis of Motive Items

Item	Pattern coefficients				Communalities
	Component				
	1	2	3	4	
Motive_F2	<b>.84</b>	.02	.01	.04	.71
Motive_F1	<b>.82</b>	.07	-.09	.01	.70
Motive_S1	.01	<b>.86</b>	-.08	-.12	.73
Motive_S2	.17	<b>.71</b>	<b>.31</b>	.08	.64
Motive_P2	-.11	.07	<b>.66</b>	<b>.44</b>	.59
Motive_W1_recoded	.09	-.08	<b>-.52</b>	.14	.33
Motive_P1	.15	<b>-.46</b>	<b>.49</b>	-.11	.50
Motive_E2	.01	-.03	<b>.45</b>	<b>-.38</b>	.39
Motive_E1	.10	-.09	.01	<b>.68</b>	.48

Motive_W2	.01	.06	-.05	<b>.65</b>	.44
Explained variance in %	18.59	13.88	11.95	10.74	
Cumulative variance in %	18.59	32.47	44.41	55.16	

Note: Factor loadings > .30 are in boldface.  
 Extraction Method: Principal Component Analysis.  
 Rotation Method: Oblimin with Kaiser Normalization.

Figure D2

Scree Plot of Exploratory Factor Analysis of Attitude to Management Items

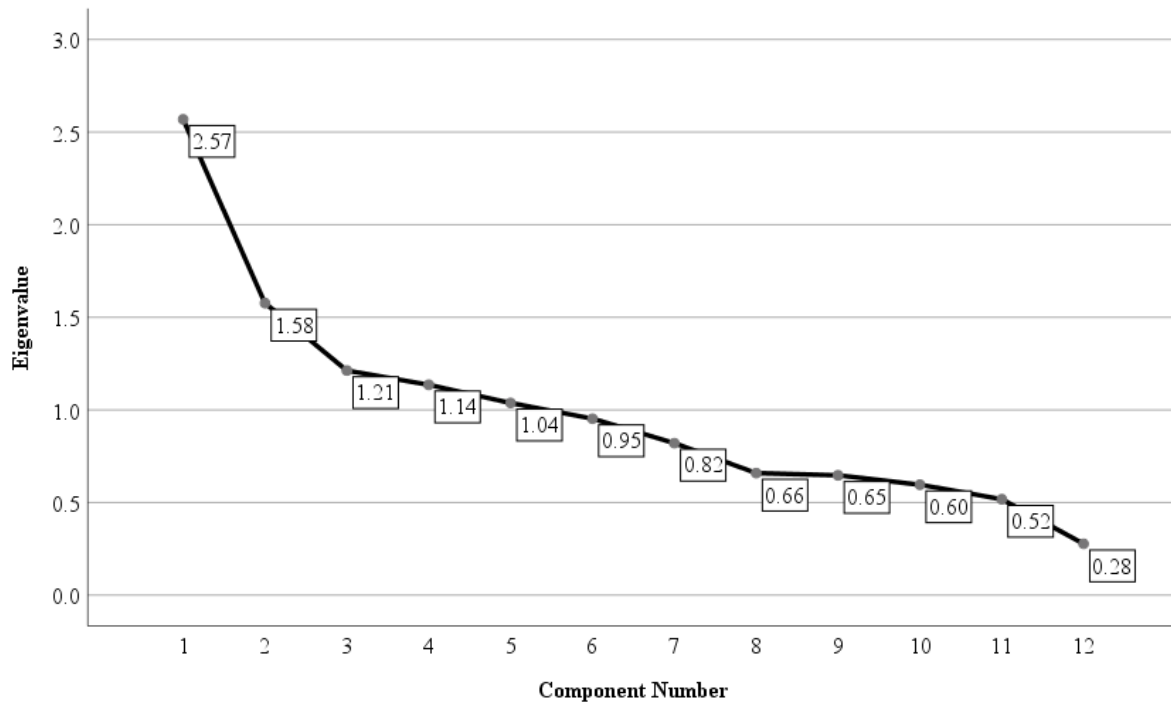


Table D10

Pattern Matrix for PCA with Oblimin Rotation of Exploratory Factor Analysis of Attitude to Management Items

Item	Pattern coefficients					Communalities
	Component					
	1	2	3	4	5	
Attitude_RV2	<b>.85</b>	-.04	.09	.05	.06	.73
Attitude_RV3	<b>.82</b>	.15	.21	-.06	-.08	.71

Attitude_RV1	<b>.63</b>	.20	-.22	.02	.15	.53
Attitude_PN1	<b>.52</b>	-.29	<b>-.35</b>	-.24	-.07	.55
Attitude_PN2	.19	<b>.75</b>	.13	-.09	-.07	.59
Attitude_I2	-.08	<b>.63</b>	<b>-.39</b>	-.05	-.18	.60
Attitude_RV4	.01	<b>.48</b>	-.08	<b>.31</b>	<b>.31</b>	.49
Attitude_F3	.25	.04	<b>-.68</b>	.27	.01	.67
Attitude_F2	<b>-.31</b>	.08	<b>-.65</b>	-.20	.09	.55
Attitude_F1_recoded	-.11	-.04	.05	<b>.88</b>	-.01	.76
Attitude_I1_recoded	.12	-.15	-.08	-.00	<b>.89</b>	.78
Attitude_F4	.29	-.16	<b>-.31</b>	<b>.38</b>	<b>-.39</b>	.57
Explained variance in %	21.41	13.14	10.10	9.46	8.65	
Cumulative variance in %	21.41	34.55	44.65	54.11	62.75	

*Note:* Factor loadings > .30 are in boldface.

Extraction Method: Principal Component Analysis.

Rotation Method: Oblimin with Kaiser Normalization.

**Appendix E**  
**Data Analysis**

Table E1

*Mean Total Sensation Seeking Scores for Different Nationalities*

Nationality	Mean	N	Std. deviation
Brazilian	23.00	1	
British	25.33	3	3.79
Danish	27.33	3	5.69
Eritrean	15.00	1	
Filipino	19.33	3	2.89
French	28.50	2	0.71
German	33.33	3	6.66
Italian	19.00	1	
Lithuanian	32.00	1	
Malawian	19.00	1	
Norwegian	25.51	114	5.45
Polish	25.67	6	6.44
Romanian	35.00	1	
Serbian	20.50	2	0.71
South Korea	17.00	2	4.24
Spanish	26.50	2	0.71
Swedish	23.00	1	
Swiss	22.00	1	
Tunisian	27.00	1	
USA	16.00	2	2.83
Total	25.23	151	5.68

Table E2

*Standard Regression with Sensation Seeking for Motive and Attitude to Management Items*

Item	R square	Standardized coefficient Beta
Motive_S1	.02	.13
Motive_S2	.01	.08
Motive_E1	.00	.04
Motive_E2	.00	.03
Motive_P1	.00	.03

Motive_P2	.04*	.20*
Motive_W1	.10**	-.32**
Motive_W2	.04*	.20*
Motive_F1	.03*	.18*
Motive_F2	.01	.11
Attitude_I1	.01	.11
Attitude_I2	.00	-.02
Attitude_F1	.06**	.25**
Attitude_F2	.01	.09
Attitude_F3	.00	-.06
Attitude_F4	.00	-.06
Attitude_PN1	.01	.10
Attitude_PN2	.00	-.05
Attitude_RV1	.00	.06
Attitude_RV2	.01	.07
Attitude_RV3	.01	.08
Attitude_RV4	.00	-.04

\*. Variable is significant at the 0.05 level.

\*\* . Variable is significant at the 0.01 level.

Table E3

*Hierarchical Multiple Regression for Motive and Attitude to Management Items*

Item	R square model 1	R square model 2	R square change	Standardized coefficient Beta				
				Gender	Age	Nationality	Experience	Sensation seeking
Motive_S1	.05	.05	.01	.00	-.01	-.05	.20*	.10
Motive_S2	.12**	.12**	.00	-.20*	-.15	.10	.21*	-.02
Motive_E1	.02	.02	.00	.06	.05	.12	-.00	.05
Motive_E2	.03	.03	.00	-.15	.05	-.03	-.12	.07
Motive_P1	.01	.01	.00	.02	-.07	-.03	.09	-.01
Motive_P2	.04	.08*	.04*	-.05	.05	-.20*	.10	.22*

Motive_W1	.10**	.21**	.11**	-.14	-.22*	-.15	-.07	-.38**
Motive_W2	.01	.04	.03*	.03	.02	.05	.01	.20*
Motive_F1	.09*	.11**	.03*	-.24**	.07	.07	.07	.19*
Motive_F2	.12**	.14**	.02	-.15	.17	.22*	.01	.16
Attitude_I1	.05	.07	.02	-.07	.05	-.13	-.19*	.17
Attitude_I2	.09**	.09*	.00	-.10	.01	-.30**	-.03	.01
Attitude_F1	.07*	.11**	.04*	-.09	.05	.08	.15	.23*
Attitude_F2	.08*	.08*	.00	-.10	-.16	.10	-.17*	.04
Attitude_F3	.08*	.09*	.01	-.15	-.12	-.23*	.02	-.09
Attitude_F4	.02	.02	.00	.03	.04	-.13	-.04	-.03
Attitude_PN1	.04	.05	.01	-.06	.02	-.21*	.04	.12
Attitude_PN2	.11**	.11**	.00	-.17*	.05	-.29**	-.11	.02
Attitude_RV1	.05	.06	.00	-.04	-.00	-.20*	.15	.05
Attitude_RV2	.07*	.08*	.00	-.06	-.12	-.20*	.13	.02
Attitude_RV3	.05	.05	.00	-.01	-.03	-.16	.15	.06
Attitude_RV4	.03	.04	.01	-.06	-.16	-.08	.13	-.12

\*. Variable is significant at the 0.05 level.

\*\* . Variable is significant at the 0.01 level.