The COVID-19 outdoor recreation boom

A comparative case study of motivational based national park visitation in Germany and Sweden

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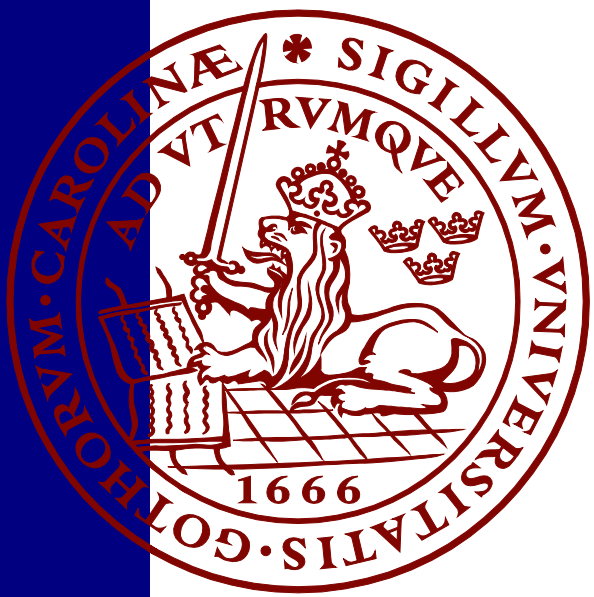

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Abstract:

COVID-19 has generated a visitor increase to national parks, posing challenges, such as littering and crowding. Understanding visitor motivation can help the national park management to better facilitate the dual objective of providing recreational opportunities and nature protection. This thesis studies the motivation of national park visitors and the pandemics' impact on motivation, by comparing the cases of Söderåsen (Sweden) and Black Forest (Germany). We gather data by conducting interviews (N=22) and surveys (N=301). For the survey, we used Driver's Recreation Experience Preference scale. A factor analysis revealed five motivational factors, with *Holistic nature experience* being of greatest importance. It further revealed that COVID-19 had differing impacts on the visitors' motivation. The interviews supported these findings and provided further motivational insights. As a result of this work, the management of Söderåsen and Black Forest gained knowledge about their visitors and Driver's motivational scales have been further tested.

Keywords: Söderåsen, Black Forest, REP scale, Sustainability, Outdoor recreation, National Park management

Word count: 11 518

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List of abbreviations

Black Forest	BF
National park	NP
Recreation Experience Preference	REP
Research question	RQ
Söderåsen	SÅ

1 Introduction

The current anthropocentric regime, where humans have a significant impact on Earth's ecosystems, creates tensions between humans and nature to co-exist (Lewis & Maslin, 2015). Human-nature relationships are often complex, and human activity rarely has a sustainable impact on nature. This relationship is prominent in national parks (NP), which are important for a variety of reasons. Aside from their purpose to protect biodiversity, they also provide outdoor recreational opportunities, which increase well-being and nature connectedness (Winter et al., 2020). During the past two years, nature has provided an opportunity for people to cope with the restrictions of the COVID-19 pandemic (Andersson et al., 2021), which required people to find alternative ways of socializing, traveling, and other daily activities. One adjustment was increased activity in outdoor recreation (Bryant, 2020), which led to a recreational boom in nature areas in several countries, such as Great Britain, Germany, Sweden, and the US (Berg, 2020; Bryant, 2020; Russell, 2021; Savage, 2020).

Increased outdoor recreation generates positive spillover effects as the visitors develop nature connectedness and environmental awareness (Cartwright & Mitten, 2017). However, the increase in visitors to natural areas, such as NPs, has also led to pressure on the local environment. NP managers reported problems, such as crowding, littering, or wild camping (Hazard, 2021; Kehoe, 2020; McGinlay, 2020), and endangering the flora and fauna (Manning & Anderson, 2012). Some problems have only recently emerged because of the pandemic, whereas others were already prevalent but increased in intensity (Andersson et al., 2021; Manning & Anderson, 2012). A contributing factor that affected the environment was the increase in first-time visitors who tend to be less familiar with NP rules and may put more pressure on the surrounding environment than repeated visitors (McGinlay et al. 2020). Even though the pandemic is nearing its end, such problems may remain as many new visitors plan to continue visiting NPs post-pandemic (Skriver Hansen et al., 2021). This nexus challenges the NPs dual mission of ensuring nature protection but also providing recreational opportunities (Dudley, 2008).

For the management of NPs, the pressures induced and intensified by the COVID-19 pandemic, pose new challenges. A study by McGinlay concerning the challenges for protected areas recommended a range of management measures such as spatial planning or visitor education (McGinlay et al., 2020). One aspect the research by McGinlay (2020) did not consider was visitor motivation. However, understanding the motivations to visit a specific nature area or perform a recreational activity is of relevance for the management (Skriver Hansen et al., 2022), to satisfy the visitor's demands, and avoid conflict between visitors while also protecting the natural environment (McGinlay et al., 2020).

To contribute to a better understanding of what motivates people to visit national parks, and the implications for NPs in handling their dual mission, this thesis conducts a comparative case study of two European NPs; Black Forest (BF) in Germany and Söderåsen (SÅ) in Sweden. The work builds on Driver's (1983) Recreation Experience Preference (REP) scale, which measures the concept of outdoor recreational motivation. Following a mixed-method strategy, combining quantitative data from a visitor survey with qualitative data from semi-structured interviews, we analyze and compare visitor motivations at the two sites. Since Germany and Sweden followed different COVID-19 strategies, we also analyze whether there are differences in how COVID-19 has impacted the NP visitors and their motivations.

1.1 Research questions and aim

This paper's central point of departure is that COVID-19 generated a visitation boom in NPs, which led to new challenges for the park managers. This study aims to understand the motivations of the visitors of Black Forest (Germany) and Söderåsen (Sweden) NP and to understand what impact the pandemic had on their motivations. Our research is guided by the following research questions:

1. What are the dominant motivations of Söderåsen and Black Forest national park visitors?
2. How did the COVID-19 pandemic impact the visitors and their motivation in the two cases?

Based on the analysis of the visitors' motivations, we will discuss implications for park management. Further, we contribute to the conceptual development of REP scales that are relevant to a European outdoor recreation context by developing a scale for the measurement of motivations for NP visitations in Germany and Sweden.

1.2 Connection to sustainability science

Defining sustainability science from its early literature, Kates et al. (2001) explore it through the lens of nature-society connection, which emerged from the 1980s idea of sustainable development. As a solutions-oriented field, sustainability science is concerned with understanding the human-nature system (Miller, 2013), to find sustainable solutions (Spangenberg, 2011). This study's contribution to sustainability science is to shed light on one aspect of nature-society interaction, namely, outdoor recreationists' motivations to visit NPs. Outdoor recreation impacts different parts of societies, ranging from infrastructure and production systems to social interactions between people and within oneself

(Fredman et al., 2020). With its broad impact, it affects consumer markets, policies, and lifestyles (Fredman et al., 2020).

Clark and Dickson (2003) point out that to understand nature-society interactions, there should be a "co-production" between researchers and practitioners. Hence, this study was conducted in a collaborative process with the management of BF and SÅ NP to improve their knowledge and add value to their sustainable development because both parks expressed interest in knowing more about visitor motivation.

1.3 Navigating the thesis

This thesis is structured as follows: Chapter 2 focuses on the two cases of Black Forest (Germany) and Söderåsen (Sweden) and their outdoor recreation context and responses to COVID-19. Chapter 3 defines the theoretical approach of a motivational-based scale used in the thesis. Chapter 4 explains the usage of case study research and the mixed-method approach used in this thesis. Chapter 5 explains the results of the qualitative and quantitative research. Chapter 6 discusses the results and compares the two NPs. Chapter 7 gives a concluding summary.

2 Background

2.1 The outdoor recreational culture

Outdoor recreation in Sweden, called *friluftsliv*, is a common leisure activity and has been a part of its culture for decades (Fredman, Ankre, & Chekalina, 2019). The Swedish Government describes *friluftsliv* as: "Being outdoors in nature or cultural landscapes for one's well-being and nature-based experiences without the need for competition" (2012, p. 3, author's transl.). A supporting factor to practice *friluftsliv* is *allemansrätten*, the right to public access. It enables everyone to enjoy the outdoors by granting the right of free movement in nature (Naturvårdsverket, n. d., a). Apart from activities such as hiking, biking, or picking mushrooms and berries, allemansrätten includes wild camping (Naturvårdsverket, n. d., b). A national survey of Swedish citizens' outdoor recreation patterns showed that it is part of almost all the respondents' lives (Fredman, Ankre, & Chekalina, 2019). The most common outdoor activities are walking, biking, and being in forest areas or fields (Fredman, Ankre, & Chekalina, 2019).

When it comes to outdoor recreation in Germany, there is a strong emphasis on hiking. In the 1850s, the meaning of hiking began to change from an occupational necessity to an activity of deliberate nature experience (Dicks & Neumayer, 2010). Those times mark the start of an organized federal hiking culture and the founding of the first hiking association in 1864 (Schwarzwaldverein, n. d.). Today, about 56% of Germans are active hikers (Dicks & Neumayer, 2010). Other popular recreational activities are running, walking, and biking (Pawlik, 2021). In contrast to Sweden, wild camping is regulated by the nature conservation and forest laws of the individual federal states and largely prohibited (Amenda, 2020).

2.2 The COVID-19 context

The response to COVID-19 has been managed differently in Sweden and Germany. In Sweden, no lockdowns were imposed during COVID-19 and due to Swedish law, a general curfew was not possible (Askim & Bergstrom, 2021). As the pandemic has hindered potential traveling abroad, *'svemester'* (going on vacation in Sweden) became an alternative for those who wanted to travel. As in Germany, one response during the pandemic has been an increased interest in outdoor recreation (Skriver Hansen et al., 2021). The pandemic and the cultural importance of *friluftsliv* increased the importance of being in nature and connecting to nature for many Swedes (Skriver Hansen et al., 2021). During the

last 12 months, 85% of the Swedish population above 16 years has been in a forest or countryside area (SCB, 2022). 52% stated they visited forest or countryside areas once a week, which is an increase of 31-33% in comparison to 2008-2019 (SCB, 2022).

Like many other European countries, Germany attempted to confine the spread of COVID-19 by imposing lockdowns, and rigid limitations on social contacts (Bundesregierung, 2020; ECML, 2020). The first lockdown was introduced on March 12, 2020 with the closure of schools and childcare facilities. Moreover, it included almost a total halt to cross-border travel and the closing of all facilities that were not of necessity for daily needs such as bars, restaurants, or clothing shops until May 14, 2020 when the country began to re-open (Bundesregierung, 2020; Grote et al., 2021; Naumann et al., 2020). These measures imposed considerable limitations on touristic and indoor recreational opportunities, and an increase in visitation to nature reserves was observed (McGinlay et al. 2020). The change in leisure patterns is illustrated by recent statistics showing that participation in many leisure activities dropped in 2020. However, hiking went up by 25% (Heinsohn & Bengsch, 2021). In the case of the BF, the NP registered a 50% increase in visitation between April and June 2020 compared to the same period the year before (Baden-Württemberg, 2020).

2.3 The cases

The contrast between Sweden and Germany in handling COVID-19 was the main criterion for comparing the two NPs. Apart from this contrast, we sought to find NPs that showed a high degree of comparability. This criterion was fulfilled by BF and SÅ NP. Table 1 shows an overview of the key characteristics of the two NPs. Both parks fall under the IUCN (International Union for Conservation for Nature) category II, meaning both are protected areas set aside to protect ecological values and provide recreational opportunities for people (Dudley, 2008). Furthermore, the parks are comparable in terms of the scenic quality of their landscapes and offer a range of similar recreation opportunities. They are also both located in the proximity of densely populated areas.

Table 1. Key characteristics of Black Forest and Söderåsen National Park

	Black Forest	**Söderåsen**
Nature protection	ICUN II [1]	ICUN II [7]
Establishment	2014 [1]	2001 [8]
Size	10,062 ha [1]	1,625 ha [8]
Annual visitors (2018/19)	778,000 [2]	193,000 [9]
Proximity to bigger cities	- Freiburg (230,940 inh.): 100 km [3] - Karlsruhe (308,436 inh.): 75 km [3] - Stuttgart (630,305 inh.): 110 km [3] - Strasbourg (290,106 inh.): 54 km [4]	- Helsingborg (150,109 inh.): 45 km [10] - Lund (127,376 inh.): 50 km [10] - Malmo (351,749 inh.): 70 km [10] - Copenhagen (638,117 inh.): 110 km [11]
Population density region	Baden-Wuerttemberg: 311 inh. per sq.km [5]	Scania: 128 inh. per sq.km [12]
Activities	- Walking - Hiking - Mountainbiking - Cross-country skiing - Picknicking - Camping - Environmental education (visitor center, tours) [6]	- Walking - Hiking - Picnicking - Camping - Environmental education (visitor center) [8]
Landscape	Mountain range: coinferous forest, bog and wet heathland, lakes [1]	Rift valley: mix of deciduous and coniferous forest, arable forest land, pasture, rocky cliffs streams and lakes [8]
Sources:	[1] (Nationalpark Schwarzwald, 2021) [2] (Rüede, 2021) [3] (Statistisches Landesamt, 2020) [4] (Insee, 2021) [5] (DESTATIS, 2021) [6] (Beller, 2020; Schwab & Fox, 2020)	[7] (McGinlay et al., 2020) [8] (Soederasen Nationalpark, n.d.) [9] (Chaminade, 2022) [10] (Regionfakta, 2022, a) [11] (Statistics Denmark, 2021) [12] (Regionfakta, 2022, b)

2.3.1 Söderåsen National Park

The NP is located in Skåne county, east of Helsingborg (see Figure 1). The area is 1,625 ha and contains a variety of biological and geological qualities, such as the rift valleys in the area (Soederasen Nationalpark, n.d.). The park mainly consists of deciduous forest, but there is also mixed and coniferous forest, arable forest land, pasture, rock, and fallow vegetation and water. (Soederasen Nationalpark, n.d.) The park offers hiking trails, birding, barbecue areas, rest areas, an information center, and a nature-inspired playground (Soederasen Nationalpark, n.d.). During 2021, the park conducted a first visitor census, which showed that the park had about 193,000 visitors at its main entrance (Chaminade, 2022). The area is owned by the Swedish state, where the Swedish Environmental Protection Agency is responsible for the protection of the nature area and coordinates the work with other actors (Naturvårdsverket, n.d., c). Since the park's establishment in 2001, the regional management and supervisory is handled by the County Administrative Board of Skåne (Naturvårdsverket, n.d., c).

Figure 1. Map of Sweden and Söderåsen National Park. Own Figure.

2.3.2 Black Forest National Park

The park was established in 2014 (see Figure 2) and is the only NP in the state of Baden-Württemberg (Nationalpark Schwarzwald, 2021). The park is split in two parts, of which the bigger one, located around the Ruhestein comprises 7,615 ha, and the smaller part around Ochsenkopf 2,447 ha (Nationalpark Schwarzwald, 2021). The park is located in a mountainous landscape largely covered by spruce and fir. A special landscape feature is the *grinden*, wet heathland that formed due to forest clearance of the highlands for grazing purposes in interaction with precipitation and the red sandstone bedrock (Nationalpark Schwarzwald, 2021). The formal head of the park is the Environmental Minister of Baden-Württemberg. The regional management is handled by the National Park Administration, which is supported by the National Park Council and the National Park Advisory (Nationalpark Schwarzwald, 2021). A first systematic visitor census in 2018 revealed an annual visitation of 778,000

for 2018/19, which increased by 37% to 1 064 000 in the pandemic year 2020/21 (Rüede, 2021). The park provides a variety of recreational activities, from hiking and mountain biking to cross country skiing. It is the only NP in Germany that offers facilities for camping within the park, an activity that is otherwise strictly prohibited (Beller, 2020).

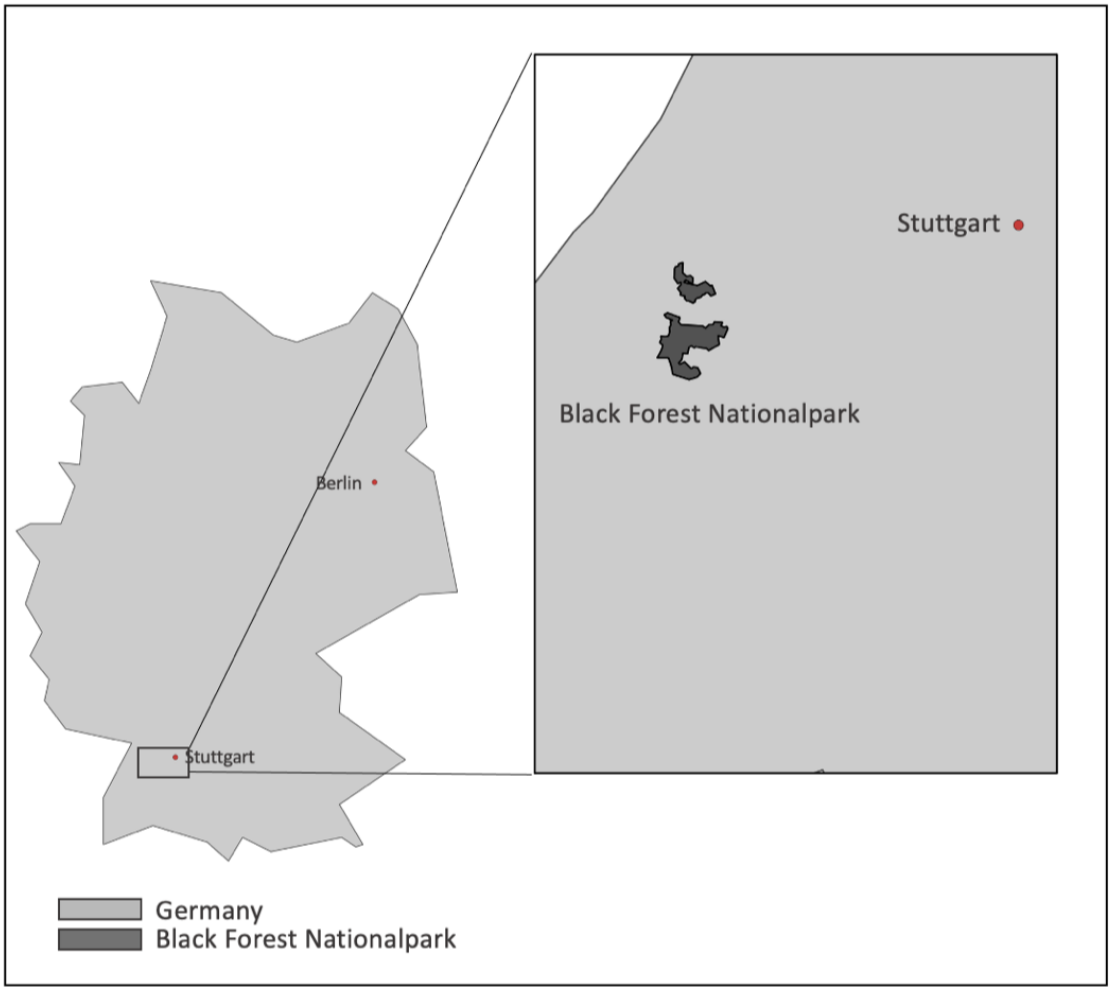


Figure 2. Map of Germany and Black Forest National Park. Own Figure.

3 Theory

3.1 Measuring motivation in the context of outdoor recreation: the REP scale

Motivation can be defined as an internal force that impacts choices to achieve a wanted outcome (Whiting et al., 2017). In this study, the concept of motivation will be researched in the context of outdoor recreation, meaning the motivation of a recreationist's choice to visit the NP. The underlying structure of motivation is multidimensional. It can be based on an individual's will to engage in an activity or desire to experience nature (Sisneros-Kidd et al., 2021). Motivation can also be influenced by new social settings, such as the COVID-19 pandemic (Humagain & Singleton, 2021), or by cultural contexts (Hsu & Huang, 2008).

In the context of recreation, motivational research is derived from expectancy theory, which studies the motivation behind an individual's decision. Vroom (1964) developed the expectancy theory as an explanation of what motivates employees to perform certain tasks, which is of importance for the management of an organization. The expectancy theory was further extended by Lawler (1969), who used it in combination with attitudinal psychology to create a model suggesting that an individual will engage in an activity or setting to achieve different psychological outcomes. Deriving from Lawler's work on expectancy theory, Driver wanted to understand recreation and followed Lawler's notion that individuals engaging in certain recreational activities or settings will experience psychological benefits (Manfredo et al., 1996). Driver studied recreation by not only focusing on the activity itself but also on the subjective view of values and attitudes as a result of free choice (Manfredo et al., 1996). Driver (1983) developed a Recreation Experience Preference (REP) scale, which measures the concept of outdoor recreational motivation in a quantitative manner where the respondents rate motivational statements. The item bank developed by Driver (1983) consists of 19 domains and 328 items, which he determined through a review of motivation literature and open-ended interviews. Through cluster-analytic procedures, these items were grouped into domains that reflect different dimensions of the concept of outdoor recreational motivation (Manfredo et al., 1996). An example is the item "To study nature", which is grouped together with similar items into the domain "Learning" (Driver, 1983). These domains and scales have further been tested and confirmed through a meta-analysis of 36 studies (Manfredo et al., 1996). Different scholars have applied the REP scale to motivational research, such as testing its cross-cultural use (Raadik et al., 2010), exploring how REPs can indicate place attachment (Budruk & Wilhelm Stanis, 2013), studying the correlation between motivations and vacation activity preference (Asan & Emeksiz, 2018).

3.2 Application of the REP scale

In this thesis, we drew upon Driver's REP scale to explore visitor motivation. Studying motivations by the means of REP scales helps researchers to understand people's engagement in outdoor recreational activities and their consequences (Manfredo et al. 1996). From a practical perspective, information about recreational motivations can help develop recreational solutions (Manfredo et al. 1996). This is also of key importance for the management of the NPs (Whiting et al., 2017), as more knowledge can help managers to better balance the dual mission of nature protection and providing recreation opportunities (Dudley, 2008). The REP scale provides information about the visitors and works as an instrument for the park management to evaluate the conditions of the NP (Raadik et al., 2010). In the long run, this yields knowledge on possible solutions for the protection of the local environment and tools on how to approach visitors (Manning, 2014). Further, this knowledge can also contribute to coping with new social settings, such as the COVID-19 induced problems of increased littering, crowding, and impact on the natural environment (Raadik et al., 2010).

The REP scales were originally developed in a North American context but have proved to be applicable to outdoor recreation in other contexts, such as Asia (Walker et al., 2001) and Europe (Raadik et al., 2010). The motivation of recreationists in a context outside North America may differ as the cultural context is diverse. Raadik et al. (2010) tested REP scales that were previously applied to a wilderness area in the State of New York, in the context of Fulufjället NP in Sweden and concluded that the scales from the U.S. are also relevant to Fulufjället NP. By developing a REP scale from a comparative study between Sweden and Germany, we contribute to the conceptual development of REP scales relevant for measuring motivations in a transnational European context.

4 Methodology

4.1 Research design

To explore the dominant motivations of Söderåsen and Black Forest visitors (RQ1), and understand how the COVID-19 pandemic impacted the visitors and their motivation in the two cases (RQ2), we conducted a comparative case study and applied a mixed-method strategy. In method literature, there are multiple definitions of what a case study is and multiple arguments on how it should be conducted. One definition is that case studies can be used to enable the researcher to examine data within a fixed context (Zainal, 2007). Further, focusing on two cases instead of a single case study gives the researcher a broader stand to test and improve the theoretical framework (Bryman, 2012). Applied to our thesis, this meant comparing outdoor recreation in the light of COVID-19 in the cases of BF and SÅ NP.

To collect data, we conducted fieldwork at both sites for two weeks in February and March 2022. Following a mixed-methods strategy, we collected quantitative and qualitative data. A quantitative survey was employed to systematically assess visitor motivations, while semi-structured interviews served to contextualize and broaden the understanding of the visitors' motives. The study material was translated into German and Swedish. To facilitate our fieldwork, we collaborated with two managers of the NPs'. In collaboration with the NP's representatives, we discussed the approach of our data collection and validated our questionnaire and interview guide. In the following sections, we explain the research instruments and the data collection and analysis approaches of the quantitative and qualitative data.

4.2 Quantitative method: Visitor survey

4.2.1 The research instrument

The quantitative part of our research concerned identifying visitor motivations in a way that would allow us to compare the two cases based on statistical significance. We designed a questionnaire containing: demographic information, a rating of visitation motivations, COVID-19's impacts on visitation, and visitors' interaction with the NP. The questionnaire is in Appendix 1. To identify the motivations for visiting the NPs we applied Driver's (1983) REP scales. In consultation with the managers of the NP's, we narrowed the original 328 items to 33 items relevant to the recreational context of the two NPs. Original items, such as: "To take risks" or "To be challenged" from Drivers' item

bank were not considered, because they were not expected to be relevant to the case of BF and SÅ. Moreover, reducing the items created a reasonable size of the questionnaire. To the original REP items by Driver (1983) we added motivational items identified by Humagain and Singleton (2021) who conducted a focus group study to identify motivations for outdoor recreation during COVID-19. From the 27 motivational items derived from their study, we selected six items that reflected the most mentioned themes and were not captured by Driver (1983). The final questionnaire thus encompassed 39 REP items (see Table 2). Each was rated on a five-point Likert scale, ranging from "Not at all important" to "Very important" (Manfredo et al., 1996). To understand the COVID-19 context questions on reduced leisure alternatives, visitation frequency and personal importance of the NP were asked. The visitors' interaction with the NP comprised questions regarding familiarity with rules, experienced problems, and the desired source for information about the park.

Table 2. REP items used in the questionnaire

Selected REP items from Driver (1983)	
Domain	**Item**
A: ACHIEVEMENT/STIMULATION	- To tell others about the trip.
B: AUTONOMY/LEADERSHIP	- To be free to make your own choices.
D: EQUIPMENT	- To test and use your equipment.
E: FAMILY TOGETHERNESS	- To do something with your family.
F : SIMILAR PEOPLE	- To be With friends. - To be with people Who have similar interests.
G: NEW PEOPLE	- To meet new people. - To see new faces
H: LEARNING	- To learn more about things [here/there]. - To experience new and different things. - To learn more about nature. - To gain a better appreciation of nature.
I: ENJOY NATURE	- To view the scenery. - General Nature Experience. - To be close to nature. - To enjoy the smells and sounds of nature. - To take in the natural surroundings. - To obtain a feeling of harmony With nature.
J : INTROSPECTION	- To reflect on your religious or other spiritual values. - To think about Who you are. - To think new thoughts.
K: CREATIVITY	- To do something creative such as sketch, paint, take photographs.
L: NOSTALGIA	- To reflect on past memories.
M: PHYSICAL FITNESS	- To get exercise. - To be physically fit.
N: PHYSICAL REST	- To relax physically.
O: ESCAPE PERSONAL-SOCIAL PRESSURES	- To help release or reduce some built up tensions. - To help get rid of some anxieties. - To give your mind a rest. - To rest awhile from the feeling of being overloaded at home or work.
P: ESCAPE PHYSICAL PRESSURE	- To experience peace and calm. - To be alone.
S: TEACHING-LEADING OTHERS	- To teach your outdoor skills to others. - To share your skill and knowledge [about things here].
Selected REP items from Humagain and Singleton (2021)	
- To detach from other things. - To be away from technology. - To explore places you have never been before. - To set yourself free from having to stay at home [during the pandemic]. - To experience normalcy [during the pandemic]. - To feel safe in an outdoor environment [during the pandemic].	

4.2.2 Data collection and analysis

To collect the data, we asked every visitor who passed our sampling spot to participate. To cover different visitor groups, we chose different sampling spots. In total, we collected 151 surveys from BF and 150 from SÅ. To improve data quality, we cleared the samples, based on the criteria presented in Table 3. After the data clearing, there were 241 valid responses of 123 for BF and 118 for SÅ.

Table 3. Data clearing criteria

Data clearing criteria
1. The respondent is younger than 18 years.
2. The REP scale is not filled in completely.
3. All REP items are rated at the same level of importance.
4. A respondent failed to fill in all 4 pages of the questionnaire.
5. The questions "When was your first visit to the NP?" (Q8) and "How often did you visit the park before the pandemic" (Q9) are answered inconsistently in the sense of replying "today" (Q8) and "never" (Q9).

For the data analysis we used the statistical package for social sciences (SPSS) version 28 by IBM. We applied multivariate statistical methods to establish relationships between the motivational items and make statistical comparisons of the motivations between the two cases. The multivariate analysis consisted of a four-step procedure outlined in Figure 3 and described in detail in the following sections. In addition to the multivariate analysis, we obtained descriptive statistics in the form of frequency tables to analyze the responses to the questions regarding COVID-19's impacts on the visitors, and their interaction with the NP.

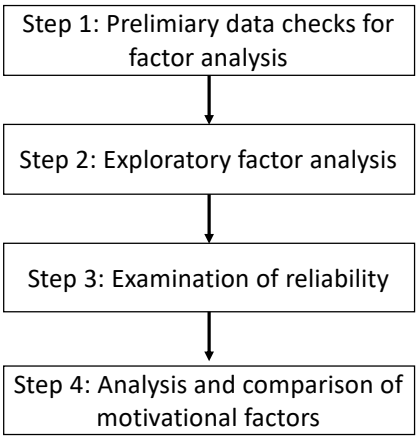


Figure 3. Steps of the multivariate analysis

Step 1: Preliminary data checks for factor analysis

To reduce the complexity of the result and identify dimensions constituting the concept of outdoor recreation motivation in the context of European NPs, we employed an exploratory factor analysis (EFA). It is a statistical method to help identify latent dimensions (factors) within a defined set of indicators (items) that measure a certain theoretical concept. The derived factors represent correlation patterns among the items. Thus, EFA helps to reduce complexity by clustering the 39 initial variables into a few factors that explain the majority of the variation in the data (Bryman, 2012; Foster et al., 2006). As we intended to investigate whether the items would form different motivational factors in the two NPs, we performed two separate EFA for BF and SÅ. Before an EFA can be conducted it requires a range of preliminary data checks to ensure the data is suitable for the analysis.

First, we determined whether the sample size was appropriate. There are no clear rules but different recommendations. We followed Kline (1994) who suggests that EFA is possible with sample sizes from 100 onwards, as long as the subject to item ratio is 2:1. Second, we tested the data for normal distribution, as the extraction method is dependent on the distribution of the data. Third, we defined the number of variables per factor. We followed the suggestion that three variables are the minimum to statistically identify a factor (Finch, 2020; Kline, 1994). Fourth, we established whether the data supports the use of EFA. To do so, we performed a Kaiser Meyer Olkin (KMO) test and Bartlett's test of sphericity. The KMO value serves to evaluate sampling adequacy (Foster et al., 2006). It ranges from 0 to 1 and is recommended to be 0.70 or above (Lloret et al., 2017). Bartlett's test of sphericity assesses whether the scale items are related (Foster et al., 2006). If it yields a p-value <0.05 the items correlate and EFA is appropriate.

Step 2: Exploratory factor analysis

After ensuring the appropriateness of the data, we conducted a first unrotated EFA. To identify items that were unrelated to any other items, we examined the commonalities. Higher commonalities are generally desirable. Items with communalities below 0.40 were deleted (Costello & Osborne, 2005). To determine the number of factors to be retained we used the Kaiser criterion, requiring that only factors with Eigenvalues above 1 are retained (Foster et al., 2006). While widely used, the Kaiser criterion is criticized for low accuracy (Foster et al., 2006). Therefore, we combined the Kaiser criterion with the examination of the Scree plot. Examining the Scree plot is a graphical method. The point at which the curve begins to flatten indicates the number of factors to retain (Foster et al., 2006). In addition, it is recommended to reflect on whether the suggested number of factors is in line with theoretical underpinnings and empirical experience (Hoyle & Duvall, 2004).

Unrotated EFA does not always yield a clear factor structure that allows meaningful interpretation. Therefore, it is recommended to perform an EFA with factor rotation to get to a simpler structure with clear factor loadings (Foster et al., 2006). We examined the pattern matrix for low item loadings, cross-loading items, and number of items per factor. Items with loadings less than 0.30 were removed (Costello & Osborne, 2005). If an item showed cross-loadings on two or more factors above 0.32 it was also deleted (Costello & Osborne, 2005). Factors with less than three items were identified, as they did not fulfill the criterion defined in Step 1. After removing the items and adapting the number of retained factors, we conducted the EFA again. The procedure was repeated until no further items and factors violated the criteria.

Step 3: Examination of reliability

To assess the quality of the scale resulting from the EFA, we performed a reliability analysis. The reliability analysis was focused on the internal consistency of the scales. It tested the degree to which the items that constitute a factor correlate with each other, in other words, how coherent they are (Bryman, 2012). To assess internal consistency, we calculated Cronbach's alpha and performed an item-total correlation test. A Cronbach's alpha above 0.6 is considered acceptable (Cortina, 1993; Nunally, 1978). An item-total correlation of less than 0.30 indicates that the behavior of an item varies from the others and should be removed from the factor (Field, 2005).

The intention of our scale development is to develop a generalizable scale to measure motivations for outdoor recreation in the context of European NPs, which allows us to compare the two NPs. To acquire an indication of the general applicability of the two scales, we performed a cross-testing of

scale reliability by applying the BF scale to the SÅ dataset and vice versa. Based on the results from the cross-testing we developed a synthesized scale that is applicable to both parks and allows us to make comparisons between each case. After we reached this synthesized scale, we named each of its factors according to its underlying motivational theme.

Step 4: Analysis and comparison of motivational factors

In the fourth step, we analyzed the motivations of the visitors and compared them between the two NPs based on the synthesized scale. To analyze the importance of the motivational factors for the visitors of the NPs, we computed the factor scores for each respondent by summing the scores per item of all items that load on the same factor and calculated averages per factor (DiStefano et al., 2009). To compare the two cases, we took into consideration the average rating and the distribution of the ratings for each factor and compared the statistics between the BF and SÅ based on hypothesis testing. As the data were non-normally distributed, we applied a Median Test to compare the average rating, and a Mann-Whitney U Test for comparison of the distributions.

4.3 Qualitative method: Semi-structured interviews

4.3.1 The research instrument

To complement the questionnaire, which works with pre-selected motivational items that limit the range of responses, we conducted semi-structured interviews, to understand the subjective perspective of the interviewee while maintaining a balance of an open and closed structure (Brinkmann & Kvale, 2015). We developed an interview guide to ensure a systematic procedure, which is in Appendix 2. The first part of the interview guide concerned the visitor's socio-demographic background. This was followed by questions about the respondents' motivations to visit the NP and whether COVID-19 had an impact on their motivation. Through interviews, the motives of the visitors are framed in their own words instead of predefined items, which helps to gain deeper and contextual information. The last questions focused on nature-related values. The idea of these questions was to gain a more general insight into the interviewees' nature-connectedness. Yet, the order of the questions was changed in some of the interviews to give the interview a better flow.

4.3.2 Data collection and analysis

The interviewees were randomly selected at different places in SÅ and BF NPs. We conducted 22 interviews in total, 12 in BF and 10 in SÅ. Except for three interviewees in BF, the participants of the interviews did not take part in the quantitative survey. Each interview took about 10 minutes. We conducted short interviews, since we approached the interviewees on-site during their visit and assumed that people would be more likely to agree to a shorter interview. During the interviews, we took notes instead of using a tape recorder, as this created a more informal atmosphere, in which we expected participants to talk more openly. Further, having a recorder present can challenge the interview's possibility of being conducted (Esaiasson et al., 2017). However, not recording the interview required us to be attentive listeners and focus on the essentials (Brinkmann & Kvale, 2015). As recommended by Esaiasson et al. (2017), we wrote a summary directly afterward.

To analyze the interview data, we followed Esaiasson et al.'s (2012) suggestion for a two-step analysis of interviews. In the first step, we categorized the material. The answers were coded into categories and then subcategories. In the second step, we summarized the categorized answers for a descriptive comparison, which allowed us to contextualize and broaden the understanding of the visitors' motives from the surveys.

4.4 Ethical considerations

Aligned with the Swedish Vetenskapsrådets "Good Research Practice" from 2017, this study followed the principles of ethical research. As researchers, we have an obligation to conduct trustworthy quality research that takes on responsibility for the people who participate (Vetenskapsrådet, 2017). More specifically, our study participants were informed that they are subjects of research for our study and that their answers were anonymized. When we collected the data, the participants were informed that their answers will be used in our thesis and also shared with the management of SÅ and BF NP.

5 Results and analysis

5.1 Quantitative data analysis

In the following sections, we first present the results of the multivariate analysis which served to identify underlying motivational factors and compare the motivations. The EFAs from BF and SÅ result in two somewhat different scales. While the scale from BF comprises five factors, the SÅ scale contains only four factors. The reliability cross-testing of these two scales resulted in a synthesized scale consisting of the five factors: *Holistic nature experience; New experiences*; *Relief from mental pressure; Relief from COVID-19 constraints; and Physical activity with company,* which is reliable for both BF and SÅ. The comparison of the motivations between BF and SÅ revealed significant differences in the importance of the two factors: *Relief from COVID-19 constraints and Physical activity with company*. The multivariate analysis is followed by a summary of the descriptive statistics about COVID-19 impacts and NP interaction. Those support the results from the EFA. The detailed results are further explained in the following sections.

5.1.1 Results Exploratory factor analysis

The preliminary data checks showed that EFA is possible with the samples of both, BF and SÅ. With a subject-to-item ratio of 3.15 for BF and 3.03 for SÅ both fulfill Kline's (1994) recommendation. Further, KMO values of 0.738 for BF and 0.794 for SÅ, and Bartlett's test results of $p < 0.001$ indicate that the data of both samples is appropriate for the application of EFA. Since the Shapiro-Wilk test indicated non-normally distributed data for both samples, Principal Axis Factoring (PAF) was selected as an extraction method (Costello & Osborne, 2005). The results of the individual EFA for BF and SÅ are presented below.

Black Forest

The examination of the commonalities of the unrotated EFA revealed no items below the threshold of 0.40. Thus, no items were removed due to low correlation. Based on the Kaiser criterion 11 factors had to be retained. The Scree plot showed no clear inflection point, leaving room for speculation between eight or 11 factors to retain. We, therefore, decided to start the rotated EFA with 11 factors.

The first iteration of the rotated EFA with 11 factors resulted in a pattern matrix with two items with factor loadings below 0.3 and three items with cross-loadings above 0.32. Furthermore, three factors

showed to consist of fewer than three items. The low loading and cross-loading items were removed and a second iteration with eight factors was conducted. After a total of five iterations each in which further items or factors had to be removed, we reached a scale of 24 items that clustered into five factors that did not require any further adaptation. The 15 items that had been removed throughout the process are summarized in Appendix 3. The resulting scale from the BF data is shown in Table 4. The five resulting factors explain together 55.1% of the variance in the data, while factor one accounts for 21.5% percent of the variance.

Söderåsen

For SÅ, the examination of the commonalities revealed two items with communalities below 0.4. Due to low correlation, these two items were removed from the scale. Thus, we started the rotated EFA with 37 instead of 39 items. As in the BF case, the Kaiser criterion suggested retaining 11 factors. However, the Scree plot of SÅ showed a clear inflection point, indicating that we retain three factors. Due to the differing results of Kaiser criterion and Scree plot, and based on the experience from the BF case, we started the rotated EFA with five factors.

After the first iteration of rotated EFA, the pattern matrix indicated the removal of four items due to low factor loading (<0.3) and eight items due to cross-loadings (>0.32). All five factors could be retained as they consisted of more than three items. After a total of five iterations, the pattern matrix indicated no further adaptations and the EFA for SÅ resulted in a scale with four factors and 16 items. A summary of the removed items can be found in Appendix 4. The final scale from the SÅ dataset is shown in Table 5. The four factors account together for 58.8% of the variance, whereas factor one explains 29.2% of the variance.

Table 4. Final factor solution Black Forest

	Factor*				
	1	2	3	4	5
To be close to nature	0.826				
To view the scenery	0.754				
To take in the natural surroundings	0.694				
To enjoy the sounds and smells of nature	0.674				
To experience peace and calm	0.595				
To obtain a feeling of harmony with nature	0.502				
To relax physically	0.413				
To see new faces		0.814			
To meet new people		0.762			
To do something creative such as sketch, paint, take photographs		0.526			
To experience new and different things		0.490			
To explore places you have never been before		0.336			
To share your skill and knowledge about things here		0.333			
To help release or reduce some built up tensions			0.815		
To rest awhile from the feeling of being overloaded at home or work			0.788		
To help get rid of some anxieties			0.460		
To be alone			0.336		
To feel safe in an outdoor environment during the pandemic				0.802	
To set yourself free from having to stay at home during the pandemic				0.745	
To experience normalcy during the pandemic				0.729	
To be with people who have similar interests					0.722
To be with friends					0.580
To be physically fit					0.452
To get exercise					0.370
% of Variance explained	19.44	8.68	6.83	5.38	4.4

Extraction Method: Principal Axis Factoring. Rotation Method: Promax with Kaiser Normalization.[a]
a. Rotation converged in 6 iterations.
* Loadings > 0.30

Table 5. Final factor solution Söderåsen

	Factor*			
	1	2	3	4
To be close to nature	0.992			
To enjoy the sounds and smells of nature	0.700			
To experience peace and calm	0.621			
To obtain a feeling of harmony with nature	0.589			
To think new thoughts	0.409			
To see new faces		0.917		
To meet new people		0.722		
To tell others about the trip		0.471		
To rest awhile from the feeling of being overloaded at home or work			0.817	
To help release or reduce some built up tensions			0.650	
To detach from other things			0.489	
To be physically fit			0.367	
To be with people who have similar interests				0.962
To be with friends				0.543
To test and use your equipment				0.425
To gain a better appreciation of nature				0.314
% of Variance explained	26.18	35.23	42.71	47.440
Extraction Method: Principal Axis Factoring. Rotation Method: Promax with Kaiser Normalization.[a] a. Rotation converged in 5 iterations. * Loadings > 0.30				

Comparison of Black Forest and Söderåsen's solution

While the EFA from the BF sample resulted in a scale with five factors, the scale from the SÅ data consists of only four factors. The first factor is quite similar in BF and SÅ. In both cases, it encompasses the theme of nature experience. While factor one in the SÅ scale consists of five items, the BF scale includes seven. Four of the five variables from SÅ are identical to the items contained in factor one of the BF scale.

While factor two from BF consists of six items that form a theme of exploration and experience of the new, in SÅ the factor only encompasses three items and is more narrowed to the theme of new people. The two items regarding new people are included in both cases. "To tell others about the trip"

however, is only included in the SÅ scale. In contrast, the BF scale encompasses four more factors related to the experience of new things.

Factor three has again a similar theme for both cases. In both scales this factor consists of four items covering a theme of mental stress relief, however, only two of the items are identical across the scales. In the SÅ scales, factor three includes the item "To be physically fit" which brings in a physical bodily perspective. In the BF scales the variable "To be physically fit" is associated with factor five instead.

The fourth factor of the BF scale encompasses a COVID-19 theme. Such a factor has not been revealed from the SÅ data. Instead, the fourth factor of the SÅ scale is thematically related to factor five from BF, as both reveal the theme of being active together with other people. Only the item "To gain a better appreciation of nature" included in the SÅ factor seems unrelated to that theme.

5.1.2 Results reliability analysis

The reliability analysis revealed that all factors of both scales yield acceptable Cronbach alpha values above 0.6 and showed no inter-item correlations below 0.30. However, for some factors, an item reduction would yield an improvement of Cronbach's alpha. The potential improvements for each of the scales are presented in the paragraphs below and in Table 6 and Table 7. For BF, Cronbach's alpha of factor two could be marginally improved by deleting the item "To explore places you have never been before". A removal of the item "To be alone" would raise factor three to alpha 0.702. However, as the scale is reliable, the improvements are limited and the items fit thematically, we decided to retain them.

For SÅ, factor one would yield only marginal improvement by removing the item "To think new thoughts". The item is thus retained. A deletion of the item "To tell others about the trip" from factor two would yield an improvement in reliability by 0.064 to 0.774. However, as its deletion would lead to a removal of the whole factor due to only two items remaining, we decided to retain it. Factor three and four had similar issues. Since all four factors pass the reliability test as they are, and an adaptation to yield higher Cronbach alpha values would lead to fundamental changes in the scales, the factors were retained as they were.

Table 6. Result reliability analysis Black Forest

	Item-Total Correlation	Cronbach's Alpha if Item Deleted	Cronbach's Alpha
Factor 1			**0.841**
To enjoy the sounds and smells of nature	0.623	0.814	
To take in the natural surroundings	0.686	0.804	
To obtain a feeling of harmony with nature	0.568	0.824	
To relax physically	0.490	0.833	
To view the scenery	0.559	0.824	
To be close to nature	0.713	0.802	
To experience peace and calm	0.536	0.827	
Factor 2			**0.701**
To share your skill and knowledge about things here	0.299	0.699	
To explore places you have never been before	0.331	0.707	
To see new faces	0.563	0.631	
To meet new people	0.497	0.645	
To experience new and different things	0.517	0.632	
To do something creative such as sketch, paint, take photographs	0.464	0.650	
Factor 3			**0.697**
To rest awhile from the feeling of being overloaded at home or work	0.567	0.574	
To help release or reduce some built up tensions	0.621	0.548	
To be alone	0.367	0.702	
To help get rid of some anxieties	0.391	0.686	
Factor 4			**0.79**
To feel safe in an outdoor environment during the pandemic	0.620	0.731	
To experience normalcy during the pandemic	0.608	0.740	
To set yourself free from having to stay at home during the pandemic	0.671	0.670	
Factor 5			**0.637**
To get exercise	0.360	0.606	
To be with people who have similar interests	0.433	0.556	
To be with friends	0.415	0.573	
To be physically fit	0.474	0.536	

Table 7. Result reliability analysis Söderåsen

	Item-Total Correlation	Cronbach's Alpha if Item Deleted	Cronbach's Alpha
Factor 1			**0.784**
To enjoy the sounds and smells of nature	0.578	0.742	
To obtain a feeling of harmony with nature	0.607	0.729	
To think new thoughts	0.482	0.798	
To be close to nature	0.640	0.722	
To experience peace and calm	0.598	0.738	
Factor 2			**0.709**
To tell others about the trip	0.393	0.774	
To see new faces	0.655	0.455	
To meet new people	0.551	0.589	
Factor 3			**0.701**
To rest awhile from the feeling of being overloaded at home or work	0.552	0.592	
To help release or reduce some built up tensions	0.559	0.598	
To detach from other things	0.494	0.631	
To be physically fit	0.356	0.716	
Factor 4			**0.69**
To gain a better appreciation of nature	0.439	0.648	
To test and use your equipment	0.326	0.710	
To be with people who have similar interests	0.668	0.480	
To be with friends	0.485	0.619	

Scale cross-testing and development of synthesized scale

The reliability analysis of the SÅ scale on the BF data, presented in Appendix 5, revealed Cronbach alpha values below 0.6 for factor three and four. Further, factor two to four all contained items that did not pass the item-total correlation test. Even though factor two yielded an alpha above the 0.6-threshold, the item-total correlation test requires the removal of "To tell others about the trip" as this item shows a correlation of only 0.229. A removal of that item would lead to the rejection of the whole factor due to fewer than three items. Factor three and four show weak internal consistency with Cronbach alpha values of 0.550 for factor three and 0.542 for factor four. Furthermore, both factors require item removal due to low item-total correlation. In both cases, a removal of the items would

lead to the rejection of the whole factor. Overall, the cross-test reveals that the scales developed from the SÅ dataset may work in that specific case but are not reliable for more general use.

Tested on the SÅ data, the BF scale yields Cronbach's alpha values above 0.6 for all five factors (see Appendix 6). While factor one, four, and five pass the item-total correlation test and indicate no further improvement of alpha by item removal, factor two and three showed room for improvement. Factor two yields an initial alpha of 0.606. The item-total correlation test shows low values for the items "To share your skill and knowledge about things here" (0.264) and "To do something creative [...]" (0.195). A removal of these two items yields a reliable factor with four items and an alpha of 0.624. For factor three the item "To be alone" shows a low item-total correlation of 0.197. If this item is removed, the factor yields an improved alpha of 0.699. An item removal is possible as three items remain in the factor. Overall, the reliability analysis of the BF scale on the SÅ dataset shows that this scale is generally reliable in a wider context than the BF case with only minor adjustments necessary.

While the scale from the SÅ dataset faces reliability issues when applied to the BF case, the scale from BF is widely reliable when applied to the SÅ data. Since the scale from BF is applicable to both cases, we based the further analysis of the motivations for both BF and SÅ on that scale to have a common measure that allows a comparison between the cases. However, as the reliability analysis of the BF scale on the SÅ data showed that there is some room for improvement, we derived a synthesized scale based on the BF result, but optimized it by removing the items "To do something creative [...]" and "To share your skill and knowledge about things here" from factor two, and "To be alone" from factor three. This resulted in a scale of 21 items that form five factors. The synthesized scale is shown in Table 8. A reliability analysis of this scale on both datasets yielded overall satisfactory results. Following, we present the motivational themes of the five final factors and their individual reliability results.

Factor 1: Holistic nature experience

The items included in factor one (see Table 8) are related to the experience of nature. As reflected by the items, this experience goes beyond the visual capture of the scenery and includes an encounter with nature with all senses. In both BF (0.841) and SÅ (0.836) this factor shows a good Cronbach alpha, indicating that all items relate to the same theme.

Factor 2: New experiences

With its four items, factor two represents a motivation for new experiences. It shows an acceptable alpha in BF (0.654) and SÅ (0.624). For both samples, the reliability analysis indicates that Cronbach's

alpha can be improved by removing the item “To explore places you have never been before”. But as this item thematically fits into the factor it is retained in the factor.

Factor 3: Relief from mental pressure

Yielding alpha values around 0.7 in both cases factor three shows consistency among the items. It covers the theme of mental stress relief. All three items are closely related. An elimination of the item “To help get rid of some anxieties” would yield further improvement of alpha. However, as an elimination of this item does not improve the thematic coherence and would lead to a rejection of the whole factor, it was retained.

Factor 4: Relief from COVID-19 constraints

Factor four reflects a motivation for getting some distance to COVID-19 related constraints and problems. It includes three of the six COVID-related items identified by Humagain and Singleton (2021). All three items show good internal consistency with an alpha of 0.790 in BF and 0.793 in SÅ.

Factor 5: Physical activity in company

The four items of factor five construct a motivational theme of being physically active together with others. Even though Cronbach’s alpha differs by 0.047 between the two cases, they both yield acceptable values of 0.637 in BF and 0.684 in SÅ.

Table 8. Results reliability test synthesized scale

	Results reliability test on BF Data			Results reliability test on SÅ Data		
	Item-Total Correlation	Cronbach's Alpha if Item Deleted	Cronbach's Alpha	Item-Total Correlation	Cronbach's Alpha if Item Deleted	Cronbach's Alpha
F1: Holistic nature experience			**0.841**			**0.836**
To enjoy the sounds and smells of nature	0.623	0.814		0.573	0.816	
To take in the natural surroundings	0.686	0.804		0.611	0.810	
To obtain a feeling of harmony with nature	0.568	0.824		0.655	0.803	
To relax physically	0.490	0.833		0.567	0.818	
To view the scenery	0.559	0.824		0.458	0.833	
To be close to nature	0.713	0.802		0.616	0.810	
To experience peace and calm	0.536	0.827		0.643	0.807	
F2: New experiences			**0.654**			**0.624**
To explore places you have never been before	0.314	0.704		0.305	0.640	
To see new faces	0.510	0.554		0.341	0.596	
To meet new people	0.464	0.574		0.476	0.505	
To experience new and different things	0.527	0.516		0.521	0.462	
F3: Relief from mental pressure			**0.702**			**0.699**
To rest awhile from the feeling of being overloaded at home or work	0.559	0.559		0.503	0.623	
To help release or reduce some built up tensions	0.635	0.470		0.648	0.476	
To help get rid of some anxieties	0.383	0.766		0.431	0.732	
F4: Relief from COVID-19 constraints			**0.79**			**0.793**
To feel safe in an outdoor environment during the pandemic	0.620	0.731		0.647	0.706	
To experience normalcy during the pandemic	0.608	0.740		0.637	0.719	
To set yourself free from having to stay at home during the pandemic	0.671	0.670		0.625	0.732	
Factor 5: Physical activity in company			**0.637**			**0.684**
To get exercise	0.360	0.606		0.487	0.606	
To be with people who have similar interests	0.433	0.556		0.507	0.591	
To be with friends	0.415	0.573		0.473	0.614	
To be physically fit	0.474	0.536		0.402	0.657	

5.1.3 Analysis of the motivations between Black Forest and Söderåsen

The EFA and the reliability analysis resulted in a synthesized scale of five motivational factors that show internal consistency when applied to both BF and SÅ. Based on these factors the most dominant motivations for visiting BF and SÅ NP were identified and compared between the two cases. Figure 4 shows the boxplot for the data from BF and SÅ. With a median of 4.29 factor one is the most relevant motivation for the visitors of BF NP, while factor two, with a median of 2.50, is of least importance. Factor three, four, and five show to be of average importance for the visitor. In SÅ factor one is also

the most relevant motivation, with a median of 4.29. While factors three and five are of medium importance with a mean rating of 3.00, factors two and four are of low importance for visitors of SÅ NP. With a median of 2.33, factor four is the lowest rated factor in SÅ.

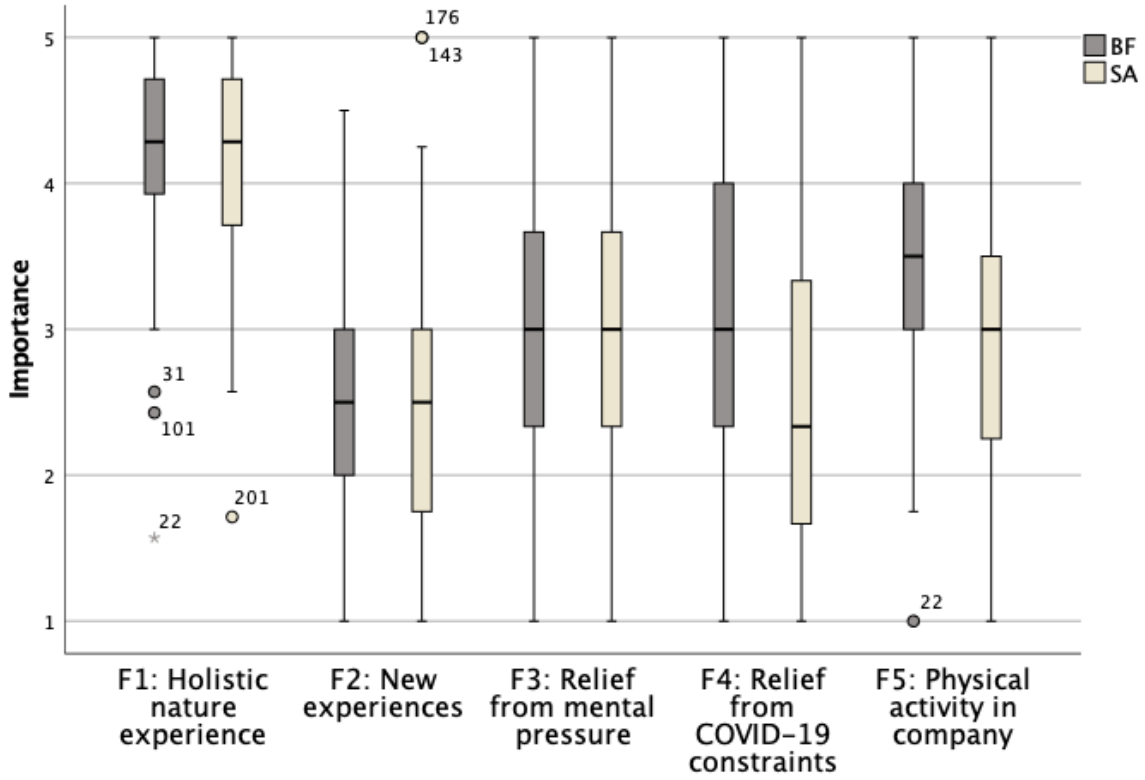


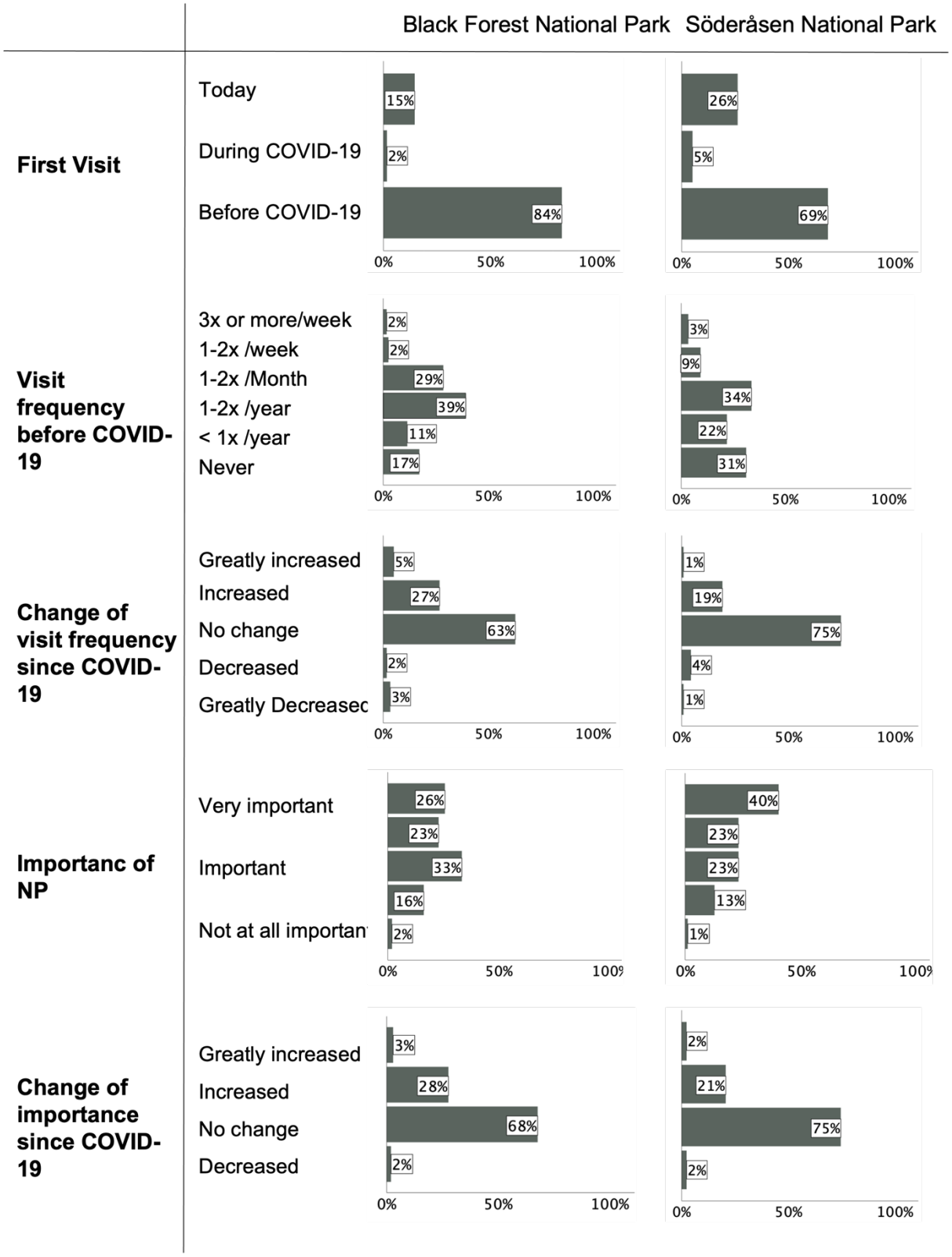
Figure 4. Importance rating of the motivational factors in Black Forest and Söderåsen

To compare, the importance of the factors one, two, and three show similar ratings across the two NPs with factor one being of high importance, factor three of medium, and factor two of rather low importance as a motivation to visit the NPs. The factors four and five however show to be of different importance in the two NPs. Statistical hypothesis testing for the ratings of these factors reveals that for factor four and five the difference of the median and the distribution of the rating between the two cases is significant. For factor four, a median of 3.00 in BF shows that the factor is of significantly higher importance for visitors to BF than for visitors to SÅ, with a median of 2.33. Further, the distribution of the ratings of this factor is also significantly different. The histograms of both NPs show a bi-modal distribution. However, while BF has one mode around 3.00 and the second at 5.00, in SÅ the first mode shows to be at 2.00 and the second at 1.00. Similarly, the median rating of 3.50 of factor five in BF shows to be significantly different from the rating of 3.00 by SÅ visitors. The distribution of the ratings of this factor is also significantly different between the two NPs.

5.1.4 Results univariate analysis

This section presents the univariate statistics of BF and SÅ relevant for understanding the COVID-19 context and the interaction of the visitors with the NPs. A summary of the most relevant statistics is found in Table 9. Most respondents in both parks had already been to the NP before the pandemic. Only 2% in BF and 5% in SÅ visited the park for the first time during COVID-19. Of the respondents who stated they had already visited the parks before the pandemic, 39% in BF and 34% in SÅ visited the park 1-2 times per year. While in SÅ only 12% said they had visited the park regularly before COVID-19, 33% of the respondents from BF are regular visitors, having visited the park at least one to two times per month. More than half of the respondents in both parks report no changes in terms of how the pandemic changed their visitations. However, a considerable number of respondents indicated an increased frequency (BF: 32%; SÅ: 20%). The question regarding the change of importance due to COVID-19 shows similar patterns. In both parks, the majority of respondents indicate no change (BF: 68%; SÅ: 75%), while there is still a share of 31% in BF and 23% in SÅ who stated that the importance increased. In both parks about half of the respondents report problems. Of the people that did experience problems, littering and crowding were the two most selected options (see Appendix 7). Furthermore, visitors of SÅ mentioned a lack of parking. In both BF and SÅ most visitors prefer the NP webpage and the visitor center as a source of information about the NP (see Appendix 7).

Table 9. Overview results univariate analysis



5.2 Qualitative data analysis

Below we present the results from the interviewees' motivation to visit the park and COVID-19's impact on their motivation. In the discussion, we will merge the qualitative and quantitative findings together.

5.2.1 Motivation to visit

A recurring motivation mentioned in the interviews with the visitors from BF was the park's landscape. The interviewees said that they came 'For the forest' and 'For the scenery in the NP'. Another motivation to visit was well-being and nature-connectedness, as the interviewees stated that they are there because they have a 'Connection to the area' and 'To enjoy the calmness that nature gives'. In SÅ, dominant motivations for visiting are that the interviewees are there for their well-being where they 'Exercise' in the form of a walk or a hike. The interviewees further mentioned that they visit as they seek a calm environment and want to 'Recharge one's battery'. Furthermore, 'Accessibility and infrastructure' were a motivation, which was expressed as restaurants, and easily accessible recreation opportunities close to their home.

The majority of the interviewees pointed out that nature plays an important or big role in their lives. Some of the interviewees found it was difficult to explain nature's role in their life. One interviewee said that nature is something inner that is difficult to explain. Another said that it gives peace and calm but also something beyond that. In both parks, the interviewees said that they visited as they wanted to 'Enjoy nature' or to 'Experience nature', as nature had an important role in their life.

5.2.2 The pandemics impact

Mixed answers were given regarding COVID-19s impact on the motivation to visit the NPs. In BF, the pandemic had an impact on many of the interviewees. However, it did not impact all of them in the same way. While some of them visited less, others stated that they came more often due to COVID-19. For example, one interviewee said that the home office allowed her to be outdoors more often. Whereas in SÅ, the majority said that COVID-19 did not have an impact on their visitation.

The questions regarding the impact of increased visitor numbers during the pandemic in the NP, only two interviewees answered this. However, it should be noted that in SÅ four interviewees could not

answer this question as they were first-time visitors. Both said that there has been an increase in visitors, and one also mentioned that there was more littering. For BF, half of the interviewees answered this question, mentioning that there was more crowding and visitors, and one mentioned more littering. To protect the local environment in the NP, interviewees proposed various solutions: Installing more trash bins, more rangers in the park, closure of trails, limitation of visitors in certain areas, and increasing visitor knowledge of nature.

6 Discussion

6.1 Interpretation of the five motivational factors

In this section we tie the results from the quantitative and qualitative analysis together and discuss them according to the five motivational factors that bear implications for the RQs:
1. What are the dominant motivations of Söderåsen and Black Forest national park visitors?
2. How did the COVID-19 pandemic impact the visitors and their motivation in the two cases?
Derived from the visitor's motivations, implications for the management are presented. Furthermore, we included a section that discusses our conceptual contribution to the REP scale development.

6.1.1 Factor 1: Holistic nature experience

In both parks, the factor *Holistic nature experience* is rated the highest by the survey participants, which shows experiencing nature is the most important reason to visit the NPs. This finding supported by the interviews. When asked about their motivations for visiting the NP interviewees in both parks mentioned motivations related to this factor. A recurring motivation from the interviews was to “enjoy nature/experience nature”. One interviewee's motivation to visit BF NP was to enjoy nature since the park offers a space to recharge one's battery. Similarly, interviewees from SÅ state being outside in nature as their motivation. Our conclusion is that the factor *Holistic nature experience* is a general motivation for recreating outdoors. This also supported by literature that shows that outdoor recreation in nature is part of both Sweden’s and Germany's cultural contexts (Fredman, Ankre, & Chekalina, 2019; Dicks & Neumayer, 2010).

Our study also shows which kind of experiences motivates people to visit. They are not only motivated by experiencing the visual quality of the landscape but express a desire to experience the natural environment with all their senses. They seek a feeling of harmony with nature and to relax in a peaceful environment. While factor three captures the desire for stress relief, more in terms of coping with health affecting mental stress, factor one can rather be interpreted as the desire to recharge one’s batteries in a calm environment to maintain resilience. This is further supported by Cole and Hall (2010) who showed that a stay in nature has a positive impact on a person's ability to cope with stress.

6.1.2 Factor 2: New experiences

The factor *New experiences* is of least motivational importance for the visitors of both parks. The factor shows that the newness is related to both people and the visited location. In the interviews, a first-time visitor in SÅ mentioned that the motivation to visit the park was to see new things. Based on the high importance of factor one, which indicates a desire for calmness and connectedness with nature among the visitors, it is plausible that the possibility of meeting new people plays a rather low role for them to visit the park. Furthermore, as the question regarding visitation frequency reveals, a high number are repeated visitors, who visit the park at least once a year. This could be an explanation for why new experiences related to the visited location are of low relevance.

6.1.3 Factor 3: Relief from pressure

Factor three encompasses the theme of restoration of well-being. In both parks, this factor is of medium importance for the visitors. This indicates that people do not only choose to visit the NP to experience nature with all their senses and to relax but see their stay in nature also as a way to cope with mental and bodily pressure. The importance of this motivational factor may also be driven by the COVID-19 pandemic. As a WHO study revealed, global anxiety and depression increased by 25% during the pandemic (WHO, 2022). Contact with nature has multiple benefits for human well-being. Nature can serve as a 'mental anchor', a place to find stability when being overwhelmed by daily obligations or in crisis situations (Hågvar, 1998). Furthermore, a stay in nature of only a few hours already yields a considerable reduction of stress (Cole & Hall, 2010) and decreases anxiety (Bratman et al., 2015). This motivational theme also came up in our interviews. Interviewees mentioned that they came to the park for their well-being. However, the interviewees' answers did not go deeper than stating general well-being as their motivation.

6.1.4 Factor 4: Relief from COVID-19 constraints

Factor four explicitly represents COVID-19 related motivations. This factor is of different importance in the two NPs. The hypothesis testing shows that *Relief from COVID-19 constraints* is of significantly higher importance in BF. This finding is further supported by the distribution of the ratings in the two parks. While in SÅ the second-highest share of visitors rates factor four as "not at all important", the second-highest share in BF perceives this factor as "very important" to their visit. This higher relevance of the pandemic as a motivator in BF is further underlined by the responses regarding the change in

visitation frequency, and personal importance due to the pandemic. In BF the share of participants who stated that their visitation increased and that the NP became more important as a result of the pandemic was higher than in SÅ. This difference was also reflected in the interviews. In BF, most of the interviewees said that COVID-19 had an impact on their visitation. How it impacted differed, as some of them came more often and some of them less, which is contradictory to the findings from the survey. The majority of the interviewees in SÅ, on the other hand, said that COVID-19 did not have an impact.

The motivational differences in factor four between the two cases seem to reflect the different pandemic approaches in Sweden and Germany. While in Germany people experienced rigid restrictions on essential freedoms (Bundesregierung, 2020), the Swedish population could widely stick to daily routines (Askim & Bergstrom, 2021). These results indicate that Germany's approach to COVID-19 pandemic impacted the population's desire to get outdoors. A study by Espiner et al. (2022) also supports these indications, as it shows that coping with the pandemic's impacts, led to an increased appreciation for outdoor recreation. Outdoor recreation could be a coping tool for social isolation as it offers a free space in contrast to the restrictions of everyday life and offers a social area that otherwise was not possible (Sivan, 2020). This increased demand for outdoor recreation was also observed in other European countries that had rigid COVID-19 measures in place. Fredman & Margaryan (2021) states that in the spring of 2020, Oslo had a 291% increase in outdoor recreation activities during the lockdown period. A similar pattern was also shown in the Netherlands (van Leeuwen et al., 2020) and in the UK (Day, 2020).

6.1.5 Factor 5: Physical activity in company

The importance of the factor *Physical activity in company* differs between BF and SÅ. For visitors of BF this factor is of significantly higher importance than for the visitors of SÅ. In the interviews, a few of the interviewees said that part of their motivation was due to physical activity, but only one said that they were there for exercise together with their friends. This difference could be explained through the range of activities that are offered, where BF offers activities such as snowshoeing and cross-country skiing. Another explanation could be the COVID-19 related shutdown of indoor activities in Germany (Bundesregierung, 2020), as regulations hindered indoor activities, outdoor activities were one possibility to do something with other people.

6.2 Additional motivations from interviews

The semi-structured interviews served to contextualize and broaden the understanding of the visitors' motivations. Many of the interviewees' answers were similar to the synthesized scale. However, the interviews also revealed additional motivations. In BF, a recurring theme was the flora of the park. Visitors stated that they came for 'The coniferous forest', which is a special feature of BF NP. This could be interpreted as belonging to the factor *Holistic nature experience*, where the importance of nature is highlighted. However, as the factor does not explicitly mention forest or trees, we did not want to make a subjective interpretation and assign it to that factor. Another recurring theme was 'Connectedness' to the area. Some of the interviewees explained that they felt home in the area and felt connected because they had visited the park multiple times. This indicates that the visitors become attached to the location, attribute meanings to it and identify themself with the place (Borrie & Birzell, 2001). A further aspect mentioned that was not covered by our scale was 'Accessibility and infrastructure'. People said that they chose to visit the NPs as it was an affordable and easily accessible recreation opportunity. In BF multiple interviewees were also attracted by the infrastructure in terms of restaurants and serviced cabins that offered a pleasant opportunity for a break and were seen as a highlight.

6.3 Implications for the National Parks management

As previous research has shown, outdoor recreation in nature areas increased in multiple countries during the pandemic (Berg, 2020; Bryant, 2020; Russell, 2021; Savage, 2020). For many this was a way to cope with the restrictions of daily life. However, while nature contributed to relieving some pressures and constraints during COVID-19, this coping behavior has shown to bring new challenges (Hazard, 2021). This is also reflected in the results from our questions regarding experienced problems, which were mainly crowding and littering. The issue is also confirmed by McGinley et al (2020) who said that COVID-19 intensified these problems in some NPs. In connection to the factor *Holistic nature experience* this bears implications for the parks' management. Since the main motivation to visit the NPs is the experience of a calm and peaceful environment, it is crucial for the management to ensure that despite rising visitor numbers the parks continue to provide calm spots for visitors to retreat to. This motivation also implies a potential threat to the parks' nature protection objective. Studies during the pandemic have shown that visitors who seek calmness and less crowded areas leave the trails (Andersson et al., 2021) and can thereby disturb the wildlife. Thus, if the parks want to ensure that the recreation experience is in line with protective objectives, the management has to consider external

factors beyond their control such as a pandemic that may directly affect internal factors of the NP such as crowding and littering. One management approach could be visitor limitation approaches, in general or for specific retreat areas. More solutions were given by the interviewees when asked about how to protect the local environment in the NP. They suggested solutions, such as: Installing more trash bins, having more rangers in the park, closing trails, and providing visitors with more knowledge about nature. As the survey indicated a strong interest in the visitor center and NP webpage as an information source, the NPs could use these two channels to also provide more knowledge to raise environmental awareness.

As motivation is shaped by one's social setting (Humagain & Singleton, 2021), COVID-19 is not the only impact on the motivation but other factors are also involved. Crises happen all the time, such as war in Europe, and that can also impact the motivation of the visitors. Understanding motivation and the pandemic's impact on motivation is one out of multiple factors, but it is important to know what effects crises have and for management to develop long-term solutions to them. Under perceived uncertainty, people may also be drawn to the local outdoors as they show to be relevant as an accessible and affordable way to change one's setting, release some anxieties, and experience some normalcy.

Considering the visitor's voice when developing solutions to NP challenges may be advisable for the management. Our interviews showed a strong attachment to locations among the visitors and the interviewees also said that nature plays a big role or is important in their life. The place attachment and 'Connectedness' motivation come back to the rooted idea in the philosophical and ecological foundation of environmental connectedness. For example, Aldo Leopold's 'land ethic' (cited in Beery, 2013) argued that people and land are intertwined and that a moral code of conduct grows out of this connection. Goralnik and Nelson (2011) further build on this idea, where they argue that a connection to an area will posit value to it. Developing solutions together with the visitors and considering their views can have long-term implications, of valuing the area and uphold a moral code of conduct. Viewed through a cultural context, Swedish friluftsliv impacts the view on nature and creates a social identity of nature connectedness (Beery, 2013). In SÅ, *allemansrätten* is a key element of Swedes environmental awareness (Beery, 2013). Maintaining the role of *allemansrätten*, through environmental education, is of importance in Sweden to ensure nature connectedness.

6.4 Conceptual contribution

Through EFA, we developed a scale that measures motivations of visitation to NPs in a European context. Thereby we reduced the complexity of the scales from initially 17 domains to five factors that show to reliably represent relevant motivational dimensions for visiting the NPs, including motivational aspects specific to the COVID-19 pandemic. Appendix 8 shows how the 17 original domains are represented in the five factors. In terms of a broader relevance of our developed scale, the successful reliability testing of the synthesized scale on the BF and the SÅ sample provides a first indication that the scale can be used to measure motivation for the visitation of NPs in a broader European context.

6.5 Critical reflection and future research

This paper aimed to understand the general motivations of outdoor recreationists and the impact of COVID-19 on their motivation to visit NPs and derive new knowledge about the visitors for the management of the NPs. To gain this knowledge we applied quantitative and qualitative research methods. A strength of the quantitative survey was that it helped us to systematically collect data from a large sample size in a way that allowed us to statistically compare the results of the two cases. However, even though the cross-case comparison was facilitated by the quantitative study design, the size of the obtained sample was non-representative. In addition, the representativeness of the study was also affected by the short data collection period of two weeks. It is possible that visitors that come to the park during other times of the year and when there are no national restrictions have differing motivations for their visit. Thus, to gain better representativeness, a larger study over a longer time period is recommended.

The shortcomings of the closed format of the REP scales means motivations we have not explicitly asked for in the questionnaire might not be revealed. Therefore, we complemented our study with interviews. However, throughout the performance of the EFA several of the initially 39 REP items were rejected. A closer look at the deleted items reveals that six of seven of the original domains, from which we picked only one item for our survey, are not represented in our final scale. A likely explanation for this is found in Manfredo et al. 's (1996) meta-analysis of Drivers' REP scales, which revealed that the domains are widely uncorrelated. Thus, as the items from these domains did not correlate with any of the other items, they got excluded from our final scale. Some of the 39 initial items may be of relevance to the outdoor recreational context of the two NPs, but because they did not correlate with enough other items to form a factor they were excluded through the EFA. As the interpretation of single items is not sufficient to explain a whole motivational domain, we consequently refrained from interpreting

these items in the discussion. We only realized this after the fieldwork had been completed. Nevertheless, even though this may have limited our results in terms of the range of motivational factors we could extract, the developed scale with its five factors still shows to be relevant and reliable to the context of our two NPs.

One of the challenges when conducting qualitative research on motivation was the difficulty of fully grasping a visitor's experience. A visitor's motivation is impacted by different factors, such as previous experiences and a person's background (Hsu & Huang, 2008) It may be that the individual might not be aware of their motivations (Dann, 1982). An example of this is when the interviewees said that "it is nice to be outside", but did not provide a 'deeper' answer. Yet, it could also be because we did not ask the "right" questions. Another challenge is that the respondents may not wish to reflect or are unable to reflect on the real travel motives, or the problem of not wishing to express or not being able to express real travel motives (Dann, 1982).

In addition to a more representative study design that improves the generalizability of the results, future research could employ a cross-sectional analysis of motivations, distinguishing different visitor profiles based on categories, such as first-time or repeated visitors, gender, age group, or recreational activity. This could yield a more detailed picture of the motivations of specific visitor groups in the NP, which would allow the NP management to develop tailored solutions. Furthermore, the reliability of the developed REP scale could be further assessed by applying it to other European NPs.

7 Conclusion

This study aimed to understand the motivations of the visitors of BF and SÅ NP and to understand what impact the pandemic had on their motivations. Our results revealed five motivational factors that explain the visitation of the NPs. Three of the five factors were of similar importance for the visitors of both parks: *Holistic nature experience; New experiences; and Relief from pressure*. In both cases, the visitor's importance ranking revealed that the factor *Holistic nature experience* is the most important motivation. *New experiences,* on the other hand, were of least importance in BF and SÅ. The COVID-19 pandemic showed to have an impact on the visitors' motivations. However, this impact differed between the two cases. In BF the motivation for some *Relief from COVID-19 constraints* showed to be significantly more important than in SÅ. These motivations were also mentioned by the interviewees. Additionally, 'Being in the forest' and 'Connectedness' were motivations our survey did not cover.

These findings bear interesting implications. The difference in the importance of *Relief from COVID-19 constraints* seems to reflect the different approaches of managing the pandemic in Sweden and Germany. National parks can play an important role for people to cope with constraints on their daily life. Of more immediate relevance for the management, is the high importance of the factor *Holistic nature experience.* This factor reflects a desire of visitors to experience calmness, but also the potential of going off trail and disturbing wildlife and endangering flora if quiet areas are not available. To prevent this, visitor education and involvement must be developed and encouraged. NPs are there to generate nature connectedness, to promote environmental awareness and responsibility which in the long run may lead to a greater extent of environmental awareness among the BF and SÅ visitors.

Another contribution of this thesis was the conceptual development of REP scales. The successful reliability testing of the synthesized scale on the BF and the SÅ sample provides a first indication that the scale can be used to measure motivation for the visitation of NPs in a broader European context.

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9 Appendix

Appendix 1. The questionnaire

B9A511EN

Dear participant,

We conduct this survey in connection with our Master Thesis in Environmental Studies and Sustainability Science at Lund University in Sweden. The aim of this survey is to understand the motives and the profiles of the visitors to national parks in Sweden and Germany (Söderåsen and Black Forest). Based on the understanding of the visitor's motives we aim to derive recommendations for the management of the national parks.

By taking part in this survey, you agree that the information you provide in the questionnaire is used for the purpose of our master thesis. An anonymized dataset of the survey results will also be handed over to the national park administration.

The survey will take approximately 10 minutes to complete.

Thank you for your participation.

How to fill in the paper survey
Below you can see how you mark an answer option in the check boxes, and how you change a selection.

☒ The answer option has been marked correctly

☒ The answer option has been marked incorrectly, the cross must be in the middle of the box

☒ The answer option has been marked incorrectly, the cross is too strong

☒ Changed selection, the answer option will not be counted as being marked

Gender

☐ Female ☐ Male ☐ Diverse

Age

Country and zip code (optional)

How did you travel to the national park?

What activities are you here for today?

☐ Walking ☐ Jogging ☐ Hiking ☐ Observing nature ☐ Bird watching
☐ Picknicking ☐ Photographing ☐ Bicycling ☐ Visiting nature centre
☐ Cross-country skiing ☐ Downhill skiing ☐ Snowshoeing ☐ Other, please specify:

1

Below you are presented with a variety of potential motivations for visiting the national park. Please rate each of the presented items according to the relevance for your visit.

	1 - Not at all important	2	3 - Important	4	5 - Very important
To rest awhile from the feeling of being overloaded at home or work	☐	☐	☐	☐	☐
To share your skill and knowledge about things here	☐	☐	☐	☐	☐
To help release or reduce some built up tensions	☐	☐	☐	☐	☐
To explore places you have never been before	☐	☐	☐	☐	☐
To enjoy the sounds and smells of nature	☐	☐	☐	☐	☐
To get exercise	☐	☐	☐	☐	☐
To feel safe in an outdoor environment during the pandemic	☐	☐	☐	☐	☐
To tell others about the trip	☐	☐	☐	☐	☐
To take in the natural surroundings	☐	☐	☐	☐	☐
To learn more about things here	☐	☐	☐	☐	☐
To obtain a feeling of harmony with nature	☐	☐	☐	☐	☐
To relax physically	☐	☐	☐	☐	☐
To do something with your family	☐	☐	☐	☐	☐
To reflect on your religious or other spiritual values	☐	☐	☐	☐	☐
To think about who you are	☐	☐	☐	☐	☐
To think new thoughts	☐	☐	☐	☐	☐
To give your mind a rest	☐	☐	☐	☐	☐
To teach your outdoor skills to others	☐	☐	☐	☐	☐
To gain a better appreciation of nature	☐	☐	☐	☐	☐
To learn more about nature	☐	☐	☐	☐	☐
To view the scenery	☐	☐	☐	☐	☐

Below you are presented with a variety of potential motivations for visiting the national park. Please rate each of the presented items according to the relevance for your visit.

	1 - Not at all important	2	3 - Important	4	5 - Very important
To experience normalcy during the pandemic	☐	☐	☐	☐	☐
To see new faces	☐	☐	☐	☐	☐
To set yourself free from having to stay at home during the pandemic	☐	☐	☐	☐	☐
To be alone	☐	☐	☐	☐	☐
To test and use your equipment	☐	☐	☐	☐	☐
To be with people who have similar interests	☐	☐	☐	☐	☐
To be free to make your own choices	☐	☐	☐	☐	☐
To reflect on past memories	☐	☐	☐	☐	☐
To help get rid of some anxieties	☐	☐	☐	☐	☐
To be with friends	☐	☐	☐	☐	☐
To be away from technology	☐	☐	☐	☐	☐
To meet new people	☐	☐	☐	☐	☐
To experience new and different things	☐	☐	☐	☐	☐
To be close to nature	☐	☐	☐	☐	☐
To experience peace and calm	☐	☐	☐	☐	☐
To detach from other things	☐	☐	☐	☐	☐
To do something creative such as sketch, paint, take photographs	☐	☐	☐	☐	☐
To be physically fit	☐	☐	☐	☐	☐

Would you say that a lack of leisure alternatives due to the pandemic was a motivation to visit the national park?

☐Yes ☐No

When was the first time you visited this national park?

☐Today ☐During COVID-19 ☐Before COVID-19

How often did you visit this national park before the pandemic?

☐ Never ☐ Less than 1 time per year ☐ 1-2 times yearly ☐ 1-2 times monthly
☐ 1-2 times weekly ☐ 3 or more times per week

How has the numbers of your visits to the national park changed since the pandemic compared to before?

☐ Greatly decreased ☐ Decreased ☐ No change ☐ Increased ☐ Greatly increased

How would you estimate the importance of this national park for you?

1 - Not at all important	2	3 - Important	4	5 - Very important
☐	☐	☐	☐	☐

How has the importance of this national park changed for you since the pandemic?

☐ Greatly decreased ☐ Decreased ☐ No change ☐ Increased ☐ Greatly increased

Do you think that you will continue to visit this national park after the pandemic?

☐ Yes ☐ No

How familiar do you feel with the rules of the national park?

☐ Not familiar ☐ Slightly familiar ☐ Moderately familiar ☐ Familiar ☐ Very familiar

Have you experienced any of the following issues during your visit to the national park?

☐ Littering ☐ Negative impacts of visitors on the natural environment ☐ Crowding
☐ Problematic visitor behavior ☐ Other, please specify:

How would you like to find information about the national park?

☐ The national parks webpage ☐ Instagram ☐ Facebook ☐ Visitor center ☐ TV
☐ Newspaper ☐ Rangers ☐ Other, please specify:

For our study we need interviews. Would you be interested in this? We will contact you within a few days for a 15-20 minutes interview. Write your name, phone number and e-mail:

Appendix 2. Interview guide

Hello, for our master thesis in sustainability science at Lund University we try to understand the motivations of people to visit a national park. To get an insight into the motivations, we want to conduct short interviews with visitors of the national park. Would you be interested in participating in an interview?

Your answer will be treated confidential and anonymous. The answers will be used in our master thesis and the summarized data will be shared with the two national parks, Söderåsens and Black Forest. Are you okay with this?

—
Basic Information for us: Interview ID, Date, Place of Interview, Gender, Age.

Introducing questions/ background information:
Where are you from?
When was the first time you came here?
How often do you visit this place?
What activities are you here for today?

—-
Are there other natural / protected areas you visit regularly?
Which are those?
Why?

Why do you visit this place? Can you tell me about your motivations to come here?
—-
What impact did the COVID-19 pandemic have for you to visit this area?
[GER] What do you think, how will your visitation of this area change after the end of the pandemic?
[SWE] Now when things have opened up more, do you think you will continue to visit this area?
Could local outdoor tourism be a long term alternative to traveling abroad for you?
[Regular visitors] Did you experience changes in the area since the beginning of the pandemic?
—-
Now we will move on to talk generally about nature:
What role does nature / the natural environment have in your life?
We are here in a protected area, that in addition to providing opportunities for recreation, has the objective to protect biodiversity and the natural environment.
What is your opinion about using nature protected areas for leisure activities?
[If needed ask:] Do you see any challenges/ problems?
And lastly, what do you think could be possible solutions to protect the environment?
—-
Follow up questions if needed:
Could you tell more about this?
Why do you think it is like that?
Is that also your interpretation about xx?

Appendix 3. Removed REP items in Black Forest

REP ID	Item	Reason
REP_28	To be free to make your own choices	low loading (<.30)
REP_32	To be away from technology	low loading (<.30)
REP_10	To learn more about things here	cross-loading
REP_16	To think new thoughts,	cross-loading
REP_26	To test and use your equipment	cross-loading
REP_13	To do sth. With your family	low loading (<.30)
REP_14	To reflect on your religious or other spiritual beliefs	low loading (<.30)
REP_8	To tell others about the trip	cross-loading
REP_15	To think about who you are	cross-loading
REP_17	To give your mind a rest	cross-loading
REP_37	To detach from other things	cross-loading
REP_29	To reflect on past memories	low loading (<.30)
REP_18	To teach your outdoor skills to others	cross-loading
REP_19	To gain a better appreciation of nature	cross-loading
REP_20	To learn more about nature	cross-loading

Appendix 4. Removed REP items in Söderåsen

REP ID	Item	Reason
REP_13	To do sth. with your family	low commonalities (< .40)
REP_14	To reflect on your religious or other spiritual values	low commonalities (< .40)
REP_10	To learn more about things here	low loading (< .30)
REP_25	To be alone	low loading (< .30)
REP_28	To be free to make your own choices	low loading (< .30)
REP_38	To do something creative	low loading (< .30)
REP_2	To share your skill and knowledge about things here	cross-loading
REP_4	To explore places you have never been before	cross-loading
REP_9	To take in the natural surroundings	cross-loading
REP_12	To relax physically	cross-loading
REP_15	To think about who you are	cross-loading
REP_21	To view the scenery	cross-loading
REP_24	To set yourself free from having to stay at home during the pandemic	cross-loading
REP_30	To help get rid of some anxieties	cross-loading
REP_34	To experience new and different things	low loading (< .30)
REP_29	To reflect on past memories	cross-loading
REP_6	To get exercise	cross-loading
REP_32	To be away from technology	low loading (< .30)
REP_20	To learn more about nature	cross-loading
REP_18	To teach your outdoor skills to others	cross-loading
REP_22	To experience normalcy during the pandemic	cross-loading
REP_17	To give your mind a rest	cross-loading
REP_7	To feel safe in an outdoor environment during the pandemic	cross-loading

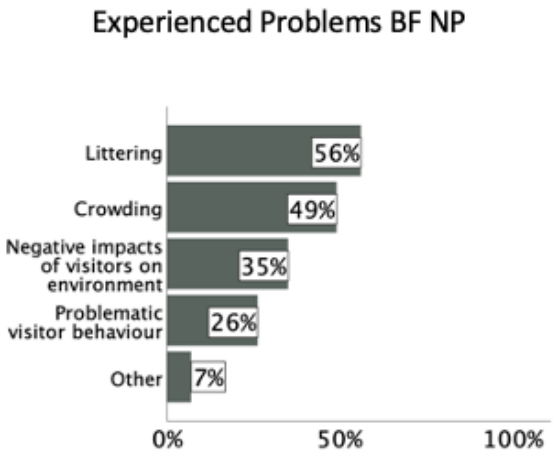
Appendix 5. Cross test Söderåsen scale on Black Forest data

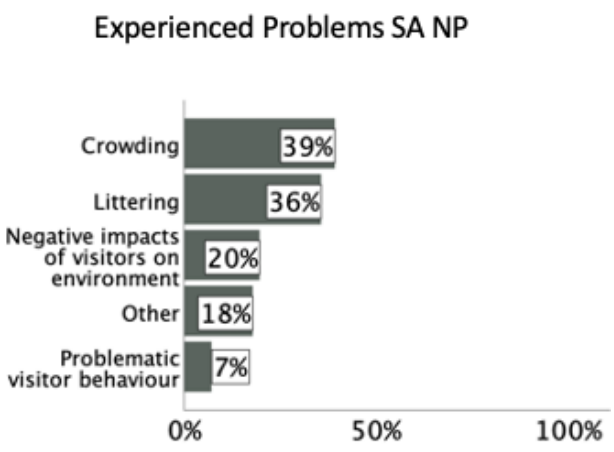
	Item-Total Correlation	Cronbach's Alpha if Item Deleted	Cronbach's Alpha
Factor 1			**0.731**
To enjoy the sounds and smells of nature	0.478	0.690	
To obtain a feeling of harmony with nature	0.576	0.650	
To think new thoughts	0.341	0.756	
To be close to nature	0.642	0.637	
To experience peace and calm	0.487	0.688	
Factor 2			**0.639**
To tell others about the trip	**0.229**	0.857	
To see new faces	0.641	0.290	
To meet new people	0.544	0.408	
Factor 3			**0.55**
To rest awhile from the feeling of being overloaded at home or work	0.397	0.421	
To help release or reduce some built up tensions	0.550	0.285	
To detach from other things	0.368	0.449	
To be physically fit	**0.062**	0.662	
Factor 4			**0.542**
To gain a better appreciation of nature	**0.191**	0.573	
To test and use your equipment	**0.171**	0.579	
To be with people who have similar interests	0.509	0.291	
To be with friends	0.463	0.333	

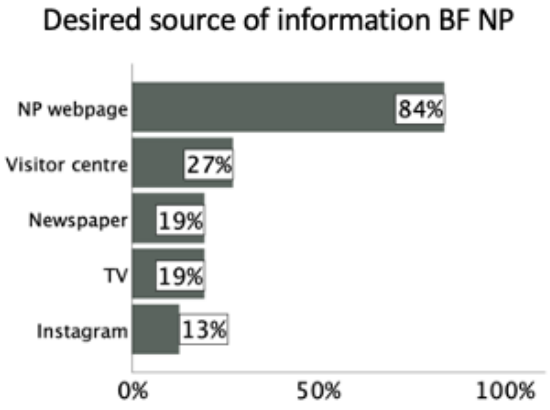
Appendix 6. Cross test Black Forest scale on Söderåsen data

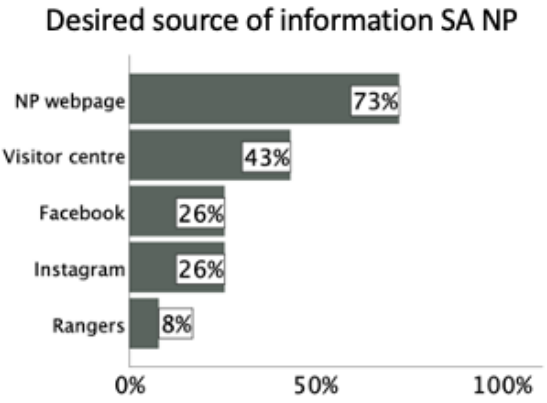
	Item-Total Correlation	Cronbach's Alpha if Item Deleted	Cronbach's Alpha
Factor 1			**0.836**
To enjoy the sounds and smells of nature	0.573	0.816	
To take in the natural surroundings	0.611	0.810	
To obtain a feeling of harmony with nature	0.655	0.803	
To relax physically	0.567	0.818	
To view the scenery	0.458	0.833	
To be close to nature	0.616	0.810	
To experience peace and calm	0.643	0.807	
Factor 2			**0.606**
To share your skill and knowledge about things here	**0.264**	0.589	
To explore places you have never been before	0.342	0.564	
To see new faces	0.338	0.562	
To meet new people	0.482	0.503	
To experience new and different things	0.443	0.515	
To do something creative such as sketch, paint, take photographs	**0.195**	0.622	
Factor 3			**0.624**
To rest awhile from the feeling of being overloaded at home or work	0.475	0.500	
To help release or reduce some built up tensions	0.576	0.451	
To be alone	**0.197**	0.699	
To help get rid of some anxieties	0.424	0.540	
Factor 4			**0.793**
To feel safe in an outdoor environment during the pandemic	0.647	0.706	
To experience normalcy during the pandemic	0.637	0.719	
To set yourself free from having to stay at home during the pandemic	0.625	0.732	
Factor 5			**0.684**
To get exercise	0.487	0.606	
To be with people who have similar interests	0.507	0.591	
To be with friends	0.473	0.614	
To be physically fit	0.402	0.657	

Appendix 7. Experienced problems and Source of information









Appendix 8. Comparison of original domains and resulting factors

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Selected REP items from Driver (1983)					
A: ACHIEVEMENT/STIMULATION					
- To tell others about the trip.			removed		
B: AUTONOMY/LEADERSHIP					
- To be free to make your own choices.			removed		
D: EQUIPMENT					
- To test and use your equipment.			removed		
E: FAMILY TOGETHERNESS					
- To do something with your family.			removed		
F : SIMILAR PEOPLE					
- To be With friends.					X
- To be with people Who have similar interests.					X
G: NEW PEOPLE					
- To meet new people.		X			
- To see new faces		X			
H: LEARNING					
- To learn more about things [here/there].			removed		
- To experience new and different things.		X			
- To learn more about nature.			removed		
- To gain a better appreciation of nature.			removed		
I: ENJOY NATURE					
- To view the scenery.	X				
- To be close to nature.	X				
- To enjoy the smells and sounds of nature.	X				
- To take in the natural surroundings.	X				
- To obtain a feeling of harmony With nature.	X				
J : INTROSPECTION					
- To reflect on your religious or other spiritual values.			removed		
- To think about Who you are.			removed		
- To think new thoughts.			removed		
K: CREATIVITY					
- To do something creative such as sketch, paint, take photographs.			removed		
L: NOSTALGIA					
- To reflect on past memories.			removed		
M: PHYSICAL FITNESS					
- To get exercise.					X
- To be physically fit.					X
N: PHYSICAL REST					
- To relax physically.	X				
O: ESCAPE PERSONAL-SOCIAL PRESSURES					
- To help release or reduce some built up tensions.			X		
- To help get rid of some anxieties.			X		
- To give your mind a rest.			removed		
- To rest awhile from the feeling of being overloaded at home or work.			X		
P: ESCAPE PHYSICAL PRESSURE					
- To experience peace and calm.	X				
- To be alone.			removed		
S: TEACHING-LEADING OTHERS					
- To teach your outdoor skills to others.			removed		
- To share your skill and knowledge [about things here].			removed		
Selected REP items from Humagain and Singleton (2021)					
- To detach from other things.			removed		
- To be away from technology.			removed		
- To explore places you have never been before.		X			
- To set yourself free from having to stay at home [during the pandemic].				X	
- To experience normalcy [during the pandemic].				X	
- To feel safe in an outdoor environment [during the pandemic].				X	