Centrality to life and the theory of planned behavior: the case of musk ox safaris in Dovrefjell-Sunndalsfjella National Park, Norway

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ABSTRACT
Understanding relationships between centrality to life and the Theory of Planned Behavior (TPB) may provide further insight on wildlife-related behaviors, as the literature suggests both have effects on behavioral intentions. Using a survey \((n = 219)\) of participants at musk ox safaris in Dovrefjell Norway, we investigated relationships between centrality to life and TPB, as well as musk ox safari participation’s perceived effects on intentions to perform three pro-environmental behaviors. Relationships were analyzed using three partial least squares structural equation models (PLS-SEM) that had \(R^2\) values of .46, 49, and .47, indicating satisfactory predictive validity. Centrality to life was related to two of TPB’s dimensions: attitudes and subjective norms. Furthermore, centrality was associated with intentions to perform all three pro-environmental behaviors. We concluded that short-duration wildlife watching activities based on a single species can be positively related to participants’ intentions, and centrality can add further insight to the TPB.

Introduction

Ajzen’s (1985) Theory of Planned Behavior (TPB) has been used for more than two decades to understand a variety of wildlife-related behaviors (Miller, 2017). Successful applications include hunting participation (Hrubes et al., 2001), donations to conservation causes (Powell & Ham, 2008), bear spray behavior among hikers (Z. D. Miller et al., 2019), and picking up litter in a national park (Brown et al., 2010). Involvement is another useful concept when studying behavioral outcomes, as highly involved participants can hold more intense attitudes and emotions, that may in turn influence future behavior (Burke & Stets, 1999; Havitz & Dimanche, 1999). Understanding a possible relationship between involvement and TPB may provide further insight on wildlife-related behaviors, as the literature suggests both TPB and involvement have effects on behavioral intentions. However, to the best of our knowledge, there are no previous studies combining TPB and involvement in a wildlife-related context.

Wildlife tourism is an increasingly popular niche within nature-based tourism that consists of activities based on interactions with non-domesticated animals (Ayazlar, 2017;...
Borges de Lima & Green, 2017a). It is often divided into zoo tourism, hunting and fishing tourism, and wildlife watching tourism (WWT; Higginbottom, 2004). WWT, which is tourism organized and undertaken to watch non-domesticated animals in their natural settings (Tapper, 2006), is especially popular and involves a variety of species worldwide (Borges de Lima & Green, 2017b).

The growing market for WWT necessitates that conservation demands are juggled with the provision of authentic wildlife experiences (Schänzel & McIntosh, 2000). Inappropriate management behaviors such as poor interpretation or inappropriate distances to wildlife can compromise animal welfare and participant safety (Curtin, 2005). One of WWT’s main justifications is its potential to improve participants’ empathy and actions toward wildlife and the environment (Ballantyne et al., 2009; Hughes, 2013). Some activities are better suited for this purpose than others (Daigle et al., 2002) and it has been argued that short duration and mass marketed activities oriented toward a single focal species may not have this effect (Curtin, 2013). Furthermore, support for outcomes associated with charismatic megafauna is lacking, and further research on how connections to a single species influence pro-environmental behavior is needed (Skibins et al., 2013).

Our study contributes to the WWT literature by investigating possible connections between TPB and centrality to life, a concept that is often used as a measure of involvement when studying participants’ degree of recreation specialization (Bryan, 1977; Harshaw et al., 2020; De Salvo et al., 2020; Scott & Shafer, 2001) and enduring involvement (Forgas-Coll et al., 2017; Jun et al., 2012; Tsai, 2020). The literature also suggest positive relationships between involvement and concern for the environment as well as behavioral action (Forgas-Coll et al., 2017; Hwang et al., 2005; Tsai, 2020). We investigated participants’ intentions to perform three pro-environmental behaviors, using musk ox safaris in Dovrefjell-Sunndalsfjella National Park in Norway as a case study. As further research is needed on outcomes associated with charismatic megafauna, we also examined effects of participants’ perceptions of whether the safari changed their environmental intentions.

Literature Review

Wildlife Watching Tourism and Pro-environmental Behaviors

Pro-environmental behaviors consciously minimize negative impacts on the Earth’s resources (Kollmuss & Agyeman, 2002). Examples include talking to others or writing letters to government officials about conservation issues, joining or donating money to environmental organizations, participating in volunteer work, and avoiding the use of harmful or unsustainable products (Apps et al., 2018).

Advocates for WWT suggest that wildlife experiences can positively impact participants’ awareness, appreciation, and behaviors, both toward the wildlife they encounter and the broader environment (Ballantyne et al., 2018, 2011a). Opponents suggest that participants’ main motivations are consumption and entertainment, and that most participants do not have strong interests in conservation (Apps et al., 2018; Buckley & Mossaz, 2018). Furthermore, the relationships among knowledge, attitudes, and behaviors are complex. Although improved environmental knowledge and attitudes are often followed by pro-environmental intentions, they are not always reliable predictors of actual behaviors (Ballantyne et al., 2018; Larm et al., 2018). On the other hand, other studies indicated
that there is still potential for positive growth in pro-environmental behaviors and that there is a subset of participants who are motivated by contributing to conservation (Apps et al., 2018; L. B. Miller et al., 2020; Buckley & Mossaz, 2018). The impacts of WWT are highly context dependent, varying among species, visitor expectations, levels of education and awareness, modes of access, frequency of tourist visits, and the number of people involved (Larm et al., 2018; Newsome et al., 2005).

In developed countries, the public often identify with large charismatic megafauna species such as dolphins, polar bears, and elephants (Dybsand, 2020; Walpole & Leader-Williams, 2002). WWT based on species such as these can help improve management bodies’ attitudes toward preserving biodiversity, be financially viable, highly popular, educational, and capable of raising awareness of threats to the species involved or the general environment (Kerley et al., 2003; Lemelin et al., 2008; Lindsey et al., 2007; Lück, 2015; Stoeckl et al., 2005; Xiang et al., 2011). As viewing preferences diversify with increasing experience, charismatic megafauna also often attract tourists to protected areas for the first time, potentially leading to more diverse preferences (Lindsey et al., 2007). However, few studies have investigated the relationship between experiences watching charismatic megafauna and intentions to engage in pro-environmental behaviors (Skibins et al., 2013).

**The Theory of Planned Behavior**

The TPB was first conceptualized by Ajzen (1985). According to TPB, intentions to perform behaviors can be predicted with high accuracy from attitudes, subjective norms, and perceived behavioral control. Behavioral intentions are usually evaluated as how likely a person is to perform a behavior in the future (Ajzen, 1985; Miller, 2017), with these intentions accounting for a considerable amount of the variance in actual behavior together with perceived behavioral control (Ajzen, 1991). Attitudes are positive or negative evaluations of a behavior or object, subjective norms are perceived social pressures or group level influences, and perceived behavioral control is an evaluation of whether someone believes they are able perform a behavior (Ajzen, 1985). In addition to its ability to examine a wide range of behaviors, TPB’s flexibility allows for the incorporation of additional predictor variables (Ajzen, 1991).

However, TPB has also been the target of criticism and debate (Ajzen, 2011). Issues raised include concerns that the model is too rational and does not sufficiently account for subjects’ cognitive and affective processes, that it neglects moral considerations, and that its static explanatory nature does not help to understand the evidenced effects of behavior on cognitions and future behavior (French & Hankins, 2003; Kollmuss & Agyeman, 2002; McEachan et al., 2011; Sniehotta et al., 2014). In particular, the problem of “inclined abstainers,” who form an intention and then fail to act, has been a recognized limitation of the theory (Sniehotta et al., 2014). However, there are also studies that confirm the theory’s ability to predict actual behaviors (Armitage, 2005; Kautonen et al., 2015; Kovač et al., 2009). According to Ajzen (2011, 2015), at its core, TPB is concerned with predicting intentions and whether intentions predict actual behaviors or not depends on factors beyond the individual’s control. Furthermore, TPB emphasizes the controlled aspects of human information processing and decision-making, and goal-directed behaviors that are steered by conscious self-regulatory processes (Ajzen, 2011).
An alternative model that focuses more on the moral dimensions of decision-making is the Values-Beliefs-Norms theory (VBN; Stern, 2000), which addresses the role that personal norms play as a moral obligation for performing a specific action or refraining from it (Delaroche, 2020; Stern, 2000). Moral considerations are presumed to be crucial in promoting conservation behavior, which explains the intuitive appeal of the VBN model (Kaiser et al., 2005). However, a pro-environmental behavior is arguably a mix of both moral considerations and conscious, rational decisions, and self-interest (Delaroche, 2020). Moreover, in a comparative study of TPB and VBN, Kaiser et al. (2005) found that TPB identified both the behavior and its proximal determinant more fully than did VBN.

**Involvement and Centrality to Life**

Another concept that may provide insight on participants’ motivations to perform pro-environmental behaviors is involvement. Individuals who are highly involved in a leisure activity are more likely to hold intense attitudes and emotions about the activity (Burke & Stets, 1999). In turn, these attitudes and emotions may serve as “an unobservable state of motivation” that influences future behavior (Havitz & Dimanche, 1999, p. 123). Recent studies on involvement show positive relationships between involvement and participation in voluntary activities, intentions to revisit, concern for the environment, perceived interpretation service quality, and behavioral action (Fedler & Ditton, 2001; Forgas-Coll et al., 2017; Hwang et al., 2005; Jun et al., 2012; Lu & Schuett, 2014; Oh & Ditton, 2008; Tsai, 2020).

One component of involvement is centrality to life, which refers to “social interactions centered on an activity” and the “central role of an activity in an individual’s life” (McIntyre & Pigram, 1992, p. 7). Centrality has also been defined as the extent that an individual organizes other dimensions of their lives around an activity (Jun et al., 2012). The term was first used to empirically examine the personal meaning of an activity by Wellman et al. (1982), who used it to measure recreation specialization and perceptions of deprecative behaviors among canoeists. The concept was later applied by McIntyre (1989), who combined it with Laurent and Kapferer’s (1985) consumer involvement profile scale to measure enduring involvement among beach campers. Centrality to life was moderately predictive of campers’ choice of recreation setting, and it was a comprehensive means of operationalizing commitment among leisure participants. Centrality to life has since been used to measure involvement in several studies on recreation specialization (Harshaw et al., 2020; McFarlane, 1994; De Salvo et al., 2020; Scott & Shafer, 2001) and identified as one of the strongest measures of specialization (Needham & Vaske, 2013; Needham et al., 2007). Centrality has also been used as one of the main dimensions of enduring involvement (Forgas-Coll et al., 2017; Jun et al., 2012; Kyle et al., 2007; Lu & Schuett, 2014; Tsai, 2020). Given that centrality to life has been used as a main dimension of involvement and the literature suggests that involvement is related to attitudes, emotions, and future behavior (Havitz & Dimanche, 1999), we tested whether centrality to life was related to planned behavior and the other dimensions of TPB in our study.

**Conceptual Model**

Our conceptual model (Figure 1) was adapted from Ajzen’s (1985) TPB to investigate centrality to life’s relationships with its dimensions. We were also interested in whether
participating in a WWT activity based on one charismatic focal species was positively related to participants’ behavioral intentions. Therefore, we added the dimension perceived effects of musk ox safari participation, measured by participants’ evaluations of whether participation changed their environmental intentions. Ideally, we would have measured effects on actual pro-environmental behaviors over time, but this was not possible within our timeframe. Instead, we measured intentions to perform three pro-environmental behaviors that benefited wildlife. Previous studies adding variables to TPB showed that when these do not directly affect behavioral intentions, they can affect them indirectly through effects on attitudes, subjective norms, or perceived behavioral control (Z. D. Miller et al., 2019; Kim & Han, 2010; Quintal et al., 2010). Therefore, we tested both the direct and the indirect effects of centrality to life and perceived effects of musk ox safari participation.

Methods

Study Site: Dovrefjell-Sunndalsfjella National Park, Norway

Dovrefjell-Sunndalsfjella National Park was established in 1974 and expanded in both 2002 and 2018 (Miljødirektoratet, 2018a). This park is one of the largest protected areas in Norway, covering approximately 4,367 km² (Miljødirektoratet, 2013). The main objectives are to conserve: (a) a large, mainly untouched mountain area with an intact alpine ecosystem and biodiversity, and (b) the natural habitat of wild reindeer herds in the area (Dovrefjell nasjonalparkstyre, 2017). Europe’s only viable herd of musk oxen is also found in the area.

The musk ox became extinct in Europe after the last ice age but was reintroduced to the Dovrefjell area between 1932 and 1953 (Nasjonalparkriket, 2019). The species is now considered reintroduced in Norway and allowed to live in a designated zone of 340 square kilometers (Miljødirektoratet, 2018b, 9). The musk ox has attracted tourists with between 3,000 and 3,500 participants on organized musk ox safaris every year (Rangbru & Seljevoll, 2017). The species has also become an important part of the area’s local identity, as the Dovre municipality’s coat of arms depicts a black musk ox on a silver background, the
largest restaurant in the municipality center Dombås is called The Musk Ox Grill, and the local tourism organization Visit Dovrefjell’s slogan is “In the kingdom of the musk ox.”

Data Collection
There were five active musk ox safari operators in the Dovrefjell area in 2018. These operators were relatively small, with one or two employees engaged in musk ox safaris who offered walking safaris that lasted three to five hours. Prices ranged from 300 to 500 NOK (approximately US 33-55 USD) per person and the maximum number of participants per safari was 15–30. To become a certified musk ox safari guide, potential guides had to complete an apprenticeship with one of the already certified guides in the area. Guiding and interpretation provided during safaris was therefore similar for all of the safari companies included in our study. The focus of the interpretation was the musk ox and other species in the area, threats to the species, the national park, and the local ecosystem and environment.

A response card questionnaire was distributed to participants in collaboration with the safari companies during the 2018 peak season. This instrument consisted of 10 questions asking about socio-demographics, nationalities, basic trip information, and contact details. In total, 487 responses were collected (417 with valid e-mail addresses). We estimated this to be approximately 12% of all participants. Although the number of responses varied from provider to provider, they reflected the size of the companies in participant volume and we judged the sample to be representative for the 2018 peak season. From November 2018 to January 2019, a follow-up questionnaire was distributed to all participants who provided valid e-mail addresses. Five contacts were made (Dillman et al., 2014) with 219 participants completing the questionnaire (52% response rate).

Measurement and Scales
This instrument consisted of 62 questions and was conducted as a part of a research project on WWT in Norway (Dybsand & Fredman, 2020; Dybsand & Stensland, 2019). In this article, we analyzed 15 questions designed to investigate participants’ perspectives on pro-environmental behaviors and 4 questions measuring centrality to life. The multi-item standard direct measures of attitudes, subjective norms, perceived behavioral control, and intentions by Ajzen (2006) was used as a basis for the TPB-portion of our questionnaire. However, the questions were adapted to musk ox safaris and there was only room for three questions measuring each of the concepts in our final questionnaire. Attitudes and intentions were treated as participants’ evaluations of three pro-environmental behaviors that benefited wild animals (participating in volunteer work, donating money to environmental organizations, becoming a member of an environmental organization). We investigated general pro-environmental behaviors rather than actions directed specifically at musk oxen, because musk ox watching is an activity not offered many places, and the species itself is not threatened. Furthermore, studies on other wildlife activities suggest that more active and involved participants show greater concern for the environment (Bryan, 1977; Fedler & Ditton, 2001; Oh & Ditton, 2008). Attitudes were evaluated on a scale from 1 (extremely negative) to 7 (extremely positive). Intentions, subjective norms, and perceived behavioral control were measured on seven-point scales from 1 (strongly disagree) to 7 (strongly agree). Subjective norms focused on respondents’
perceptions on what their peers thought about them possibly performing the behaviors. Perceived behavioral control measured respondents’ perceived possibilities to perform the behaviors, and intentions were treated as the respondents’ plans to perform them in 2019.

Centrality to life was measured with four questions adapted from Kim et al. (1997) who studied involvement, commitment, and future intentions among birdwatchers. Perceived effects of musk ox safari participation were measured by asking participants to evaluate whether the safaris had changed their attitudes toward wild animals and the environment and if they were more likely to perform three pro-environmental behaviors after participating. We measured perceived effects of musk ox safari participation because it was not possible to compare participants to individuals who had not participated in a musk ox safari. Each of the questions measuring these two added dimensions also asked participants to evaluate statements from 1 (strongly disagree) to 7 (strongly agree). An overview of all questionnaire items included in our final model is provided in Table 1.

Data Analysis

Structural equation modeling (SEM) was applied to measure the direct and indirect relationships among our concepts. There are two main approaches to SEM; covariance-based structural equation modeling (CB-SEM) and partial least squares structural equation modeling (PLS-SEM) (Hair et al., 2011). Although CB-SEM is primarily used for confirming or rejecting theories, PLS-SEM is used for developing theories in exploratory research and to identify key driver constructs (Hair et al., 2017). Small sample sizes cause identification issues when applying CB-SEM, but PLS-SEM mainly achieves high levels of statistical power even with smaller samples (Hair et al., 2017). Given that our final sample size was relatively small (n = 219) and we were interested in identifying key driver constructs, PLS-SEM was chosen for our data analysis.

Given that we wanted to investigate concepts related to participants’ intentions to perform three environmental behaviors (participating in volunteer work, donating money to an environmental organization, becoming a member of an environmental organization), we ran three PLS-SEM-models. The independent variable constructs were measured by the questions discussed above and were the same in all models. However, the key target constructs were measured by one of the behaviors for each of the models. Smart PLS 3.3 (Ringle et al., 2015) was used for computing our models and we applied the path weighing scheme (Henseler et al., 2009) when estimating parameters. The dataset was cleaned and screened for univariate and multivariate outliers. Five multivariate outliers were identified by calculating the Mahalanobis distance in IBM SPSS and removed from our sample. The final sample size for the PLS-SEM analyses was n = 214.

As PLS-SEM relies on variances to determine an optimum solution instead of covariances, covariance-based goodness-of-fit measures are not fully transferrable to a PLS-SEM context, and alternative measures have been developed to evaluate the measurement model and the structural model (Hair et al., 2017). We assessed these measures in line with guidelines for evaluating PLS-SEM-models and reporting results provided by Chin (2010), Hair et al. (2017), and (2011)).
Table 1. Final measurement model evaluation results for intentions to participate in volunteer work that benefits wildlife (Model 1), intentions to donate money to an environmental organization (Model 2), and intentions to become a member of an environmental organization (Model 3).

| Construct/Indicator                                                                 | Mean* (SD) | Outer loadings       | Composite reliability | AVE |
|------------------------------------------------------------------------------------|------------|----------------------|-----------------------|-----|
| Attitudes                                                                          |            |                      |                       |     |
| What is your attitude toward participating in volunteer work that contributes to conservation of wild animals and the environment? | 5.40 (1.43) | .772/.733/ .723   |                       |     |
| What is your attitude toward donating money to environmental organizations yourself? | 5.03 (1.60) | .881/ .901/ .889    |                       |     |
| What is your attitude toward becoming a member of an environmental organization?  | 4.85 (1.57) | .878/ .887/ .904   |                       |     |
| Subjective norms                                                                  |            |                      |                       |     |
| My family and friends expect me to participate in volunteer work that contributes to conservation of wild animals and the environment | 3.31 (1.69) | .929/ .950/ .933   |                       |     |
| My family and friends expect me to donate money to environmental organizations     | 3.17 (1.62) | .957/ .936/ .953   |                       |     |
| Perceived behavioral control                                                      |            |                      |                       |     |
| I have enough information about how to participate in volunteer work that contributes to conservation of wild animals and the environment | 4.69 (1.65) | .890/ .902/ .904   |                       |     |
| I have the opportunity to participate in volunteer work that contributes to conservation of wild animals and the environment | 5.10 (1.64) | .940/ .930/ .928   |                       |     |
| Perceived effects of musk ox safari participation                                  |            |                      |                       |     |
| After participating in a musk ox safari, I have become more positive toward conservation of wild animals and the environment | 4.49 (1.86) | .757/ .751/ .752   |                       |     |
| After participating in a musk ox safari I have become more positive toward participating in volunteer work that contributes to conservation of wild animals and the environment myself | 3.68 (1.68) | .947/ .945/ .956   |                       |     |
| After participating in a musk ox safari I have become more positive toward donating money to an environmental organization myself | 3.39 (1.70) | .948/ .953/ .952   |                       |     |
| Centrality to life                                                                |            |                      |                       |     |
| If I stopped watching wildlife, I would probably lose touch with a lot of my friends | 1.58 (1.22) | .803/ .793/ .798   |                       |     |
| I find that a lot of my life is organized around wildlife watching                 | 1.98 (1.51) | .912/ .917/ .916   |                       |     |
| Others would probably say I spend too much time wildlife watching                  | 1.74 (1.42) | .914/ .916/ .914   |                       |     |

An overview of the constructs included in our final models (bold) and their composite validity and convergent validity (measured by AVE) as well as all indicators included in each construct, their means, standard deviations and outer loadings.

*The means of all indicators are shown on scales from 1 to 7, followed by their standard deviations.
Results

Sample Characteristics

Our sample mainly consisted of Scandinavians (35%) and Germans (25%), followed by participants from the Benelux area (Belgium, The Netherlands, Luxembourg [17%]). The average age was 44 years old (SD = 15.3) and 50% were female. On average, participants stayed in the area for 2.5 days and 42% planned their trip at least 1 month in advance. All participants in our sample saw at least one musk ox during their safari, and only 10% stated that they were further than 300 meters away. On average, participants had visited 4.3 (SD = 5.4) wildlife watching places in 2017, spent 11.9 (SD = 30.6) days wildlife watching in 2017, and participated in wildlife watching for 14.5 (SD = 14) years.

Measurement Models

Given that our constructs were reflective, the first step in our analysis was to assess their reliability and validity. When indicator reliability was initially assessed, three indicators had outer loadings below the recommended threshold of .70 in all three models (Hair et al., 2017). Two of them had outer loadings below .40 and were therefore removed. The indicator with a value between .40 and .70 was also removed to ensure its construct’s composite reliability. One indicator was removed from the construct subjective norms, one from perceived behavioral control, and one from centrality to life. These constructs were therefore measured by two indicators each in our final models. Although constructs with fewer than three indicators would have been a validity issue for a CB-SEM model, PLS-SEM models can include even single-item constructs (Hair et al., 2017). Therefore, we kept the constructs in our models. The 13 remaining indicators had outer loadings above the recommended threshold of .70, reaching satisfactory indicator reliability levels. The measurement models achieved composite reliability values of .879 and higher, providing evidence of the construct measures’ internal consistency reliability. All AVE values were above the critical threshold value of .50 (Hair et al., 2017), indicating satisfactory convergent validity.

Three approaches were used for assessing the discriminant validity of constructs. First, the indicators’ cross-loadings were examined checking that no indicator loaded higher on any opposing construct. Second, the Fornell and Larcker (1981) criterion was applied, requiring that each construct’s AVE was higher than its correlation with all other constructs. Third, we assessed the heterotrait-monotrait ratios (HTMT) of the correlations (Henseler et al., 2015). These analyses all indicated that our constructs exhibited discriminant validity. We also ran the bootstrapping procedure (Chin, 1998) with 5,000 samples and the no sign changes option to derive bootstrap confidence intervals for the HTMT ratios (Hair et al., 2017). None of our confidence intervals contained the value 1, indicating that our constructs were empirically distinct. Taken together, the measurement model assessment verified that all construct measures included in our final models were reliable and valid.

Structural Models

The central criterion for assessing a structural model in PLS-SEM is the coefficient of determination R² as it evaluates the model’s predictive validity (Hair et al., 2017). The R²
values of our study’s target constructs were .46 for intentions to participate in volunteer work that benefited wildlife, .49 for intentions to donate money to an environmental organization, and .48 for intentions to become a member of an environmental organization. This indicated that the explanatory power was at satisfactory levels for our models. We also tested the predictive power of each model by applying the Stone-Geisser criterion, with Q^2 values (Geisser, 1975; Stone, 1974) obtained from running the blindfolding procedure with an omission distance D ¼ of 7. We obtained Q^2 values of .413 (model 1), .460 (model 2), and .444 (model 3). These values are well above zero, indicating satisfactory predictive relevance for our models (Götz et al., 2010). We used the bootstrapping procedure (Chin, 1998) with 5,000 samples and the no sign changes option to assess the significance of the path coefficients. Figure 2 shows all structural relationships and their significance levels.

All path coefficients in model 1 (intentions to participate in volunteer work that benefited wildlife) were significant at the .05 level, except for the coefficient between centrality to life and perceived behavioral control (p = .217). Centrality to life was significantly related to intentions, attitudes, and subjective norms. Perceived effects of musk ox safari participation were significantly and positively related to intentions, attitudes, subjective norms, and perceived behavioral control. Subjective norms were most strongly related to intentions (.275), followed by attitudes (.246).

The results were slightly different for model 2 (intentions to donate money to an environmental organization). All path coefficients in the model were significant at the .05 level except for the coefficients between centrality to life and perceived behavioral control (p = .222), perceived behavioral control and intentions (p = .892), centrality to life and intentions (p = .642), and perceived effects of musk ox safari participation and intentions (p = .115). Centrality to life was significantly and positively associated with attitudes and subjective norms, whereas perceived effects of musk ox safari participation was significantly and positively related to attitudes, subjective norms, and perceived behavioral control. Attitudes were most strongly related to intentions (.523), followed by subjective norms (.222).

In model 3 (intentions to become a member of an environmental organization), all path coefficients were significant at the .05 level, except for the coefficients between centrality to life and perceived behavioral control (p = .157), perceived behavioral control and intentions (p = .085), centrality to life and intentions (p = .951), and perceived effects of musk ox safari participation and intentions (p = .092). Centrality to life was significantly and positively associated with attitudes and subjective norms, and perceived effects of musk ox safari participation were significantly and positively related to attitudes, subjective norms, and perceived behavioral control. Attitudes were most strongly related to intentions (.446), followed by subjective norms (.239). An overview of our constructs’ direct, indirect, and total relationships with intentions to perform the pro-environmental behaviors is in Table 2.

As shown in Table 2, which variable had the strongest total relationships with intentions varied among the three behaviors. Centrality to life had the strongest total relationship with intentions to participate in volunteer work that benefited wildlife, whereas its relationships with intentions to become a member of or donating money to an environmental organization were weaker. Attitudes were most strongly associated with intentions to donate money to or join an environmental organization. Perceived effects of musk ox safari participation had the second strongest total relationships with intentions to perform these two behaviors,
whereas subjective norms had the second strongest total association with intentions to participate in volunteer work that benefited wildlife. Perceived behavioral control had the lowest total relationships with all three behaviors.

**Discussion**

**Main Findings and Contributions to Existing Knowledge**

Our study contributes to the WWT literature by analyzing centrality to life’s effects on TPB and its sub-dimensions, and perceived effects of musk ox safari participation’s effects on participants’ intentions to perform three pro-environmental behaviors that benefit wildlife. Furthermore, although WWT’s potential for environmental outcomes have been explored
in several studies (Apps et al., 2018; Ballantyne et al., 2018; Hughes, 2013), ours is, to the best of our knowledge, the first to examine this issue focusing on a short duration experience based on a single charismatic megafauna species. Moreover, previous studies indicated that there is a subset of participants who are more motivated by contributing to conservation than the majority (Buckley & Mossaz, 2018). By including centrality to life here, we were able to test whether the importance of the activity to participants’ life was related to pro-environmental intentions. This may help identify pro-environmental groups.

Results showed that centrality to life had statistically significant positive relationships with participants’ attitudes and subjective norms, whereas its relationship with perceived behavioral control was not significant. Centrality to life’s positive relationship with attitudes supports claims that individuals who are highly involved in an activity are likely to hold more intense attitudes and emotions (Burke & Stets, 1999). Centrality to life’s positive relationship with subjective norms is also not surprising. McIntyre and Pigram (1992) referred to centrality to life as “social interactions centered on an activity,” whereas Ajzen (1985) referred to subjective norms as perceived social pressures or group level influences. Our findings suggest that social interactions more centered on an activity are related to higher perceived social pressures or group level influences. This is in line with studies on serious leisure that suggest leisure activities provide a collective and social space where participants feel a strong sense of belonging, and that dedicated participants are likely to feel a stronger commitment to their leisure community (Cuskelessy et al., 2002; Dilley & Scraton, 2010).

Our results also showed that centrality to life had a statistically significant positive direct relationship with intentions to participate in volunteer work that benefits wildlife, but not with intentions to donate money to or join an environmental organization. However, centrality was indirectly related to intentions to perform all three behaviors through its relationships with participants’ attitudes and subjective norms. The direct relationship with intentions to participate in volunteer work that benefited wildlife supports Lu and Schuett

### Table 2. An overview of all constructs’ direct, indirect, and total relationships with participants’ intentions to perform pro-environmental behaviors that benefit wildlife.

| Construct | Direct | Indirect | Total |
|-----------|--------|----------|-------|
| Model 1: Intentions to participate in volunteer work that benefits wildlife | | | |
| Attitudes | .926 | - | .926 |
| Perceived effects of ox safari participation | .246 | - | .246 |
| Centrality | .161 | .189 | .350 |
| Subjective norms | .178 | .163 | .341 |
| Perceived behavioral control | .275 | - | .275 |
| Model 2: Intentions to donate money to an environmental organization | | | |
| Attitudes | .523 | - | .523 |
| Perceived effects of Musk ox safari participation | .098 | .258 | .356 |
| Centrality | .025 | .184 | .209 |
| Subjective norms | .222 | - | .222 |
| Perceived behavioral control | -.014 | -.014 | -.014 |
| Model 3: Intentions to become a member of an environmental organization | | | |
| Attitudes | .462 | - | .462 |
| Perceived effects of musk ox safari participation | .081 | .252 | .337 |
| Centrality | .050 | .198 | .236 |
| Subjective norms | .229 | - | .229 |
| Perceived behavioral control | .109 | .109 | .109 |

*The indirect effects of perceived effects of Musk ox safari participation and centrality were calculated based on their effects through the constructs attitudes, subjective norms, and perceived behavioral control.
Our Limitations

Although subjective musk environment relationships with life, researchers have suggested that involvement affects future behaviors indirectly through attitudes and emotions that act as “an unobservable state of motivation” (Burke & Stets, 1999). Our results suggest that centrality to life is also related to future behaviors through its associations with subjective norms and social pressures.

Furthermore, our results showed that the perceived effects of participating in a musk ox safari had a significant direct positive relationship with one of the three behaviors. This concept also had significant positive relationships with attitudes and subjective norms in all three models that, in turn, had significant positive relationships with intentions to perform all three pro-environmental behaviors. These findings support claims that WWT may lead to improved pro-environmental intentions (Ballantyne et al., 2011a, 2011b; Hughes, 2013; Hughes et al., 2011). Moreover, these findings show that short duration activities based on a single charismatic megafauna species can also have this effect. A study by Skibins et al. (2013) on African safaris and zoo tourism showed that connections to such species had positive relationships with pro-conservation behaviors for individual species and general biodiversity. Our findings corroborate theirs and show that activities focusing on a single charismatic megafauna species may also have positive effects. Although Skibins et al. (2013) developed their model using interactional theory, we based ours on TPB and centrality to life, thereby strengthening their conclusions with similar findings based on different concepts and theoretical frameworks.

Our findings mainly support Ajzen’s (1985) TPB. However, we did not find a significant relationship between perceived behavioral control and intentions to perform the three pro-environmental behaviors. Although significant effects were expected, which of the TPB’s three cognitive structures is most involved in a given behavioral decision varies among different behaviors and human populations (Brown et al., 2010). As perceived effects of musk ox safari participation also had stronger relationships with participants’ attitudes and subjective norms than their perceived behavioral control in all three models, a possible explanation can be a lower focus on perceived behavioral control during the safaris. Although guides provided information about threats to the musk ox, other species in the area, and the local ecosystem during safaris, they did not focus on concrete environmental actions and how participants could perform these actions. This may have contributed to its weak relationship with intentions to perform the three environmental behaviors.

Limitations and Future Research

Our data were from a case study with a sample of participants on organized musk ox safaris in Dovrefjell during the 2018 peak season. Due to the right of public access (Friluftsløven, 1957), not all wildlife watchers in the area participated in guided activities, and similar studies on visitors searching for wildlife on their own might yield different results. Moreover, the impacts of WWT on wildlife, the environment, and participants vary greatly from one activity to another (Ayazlar, 2017; Newsome et al., 2005). Our findings cannot be
generalized to all WWT experiences or all experiences based on charismatic megafauna. Nevertheless, they showed that positive environmental outcomes are possible within this group of activities, and that centrality to life may be associated with behavioral intentions through its relationships with attitudes and subjective norms. Future studies on wildlife activities based on charismatic megafauna may provide more insight on the effects of this group of activities, especially if more than one activity is compared. As centrality to life is often used as one of the main dimensions of recreation specialization (Bryan, 1977), future studies on how other dimensions of specialization are related to TPB can also provide further insight on participant characteristics and how they affect future behaviors. Similarly, centrality to life has also been used in multi-dimensional studies on involvement. Studies implementing other measures of involvement can provide further insight on its effects on TPB and future behaviors.

We measured participants’ intentions to perform pro-environmental behaviors directly after participating in the safaris. Actual pro-environmental behaviors over time would have been the best measure of positive environmental outcomes, but we did not have time or resources for a follow-up study measuring actual behaviors. Another issue preventing this was a relatively small sample size (n = 219) and a follow-up survey would further reduce our sample size, limiting possibilities for data analysis.

Management Implications

Our findings indicate that highly involved participants are more likely to have positive attitudes and strong subjective norms toward pro-environmental behaviors. These participants are also more likely to have positive environmental intentions. These findings indicate that WWT providers and managers of areas rich in wildlife should involve participants and visitors to increase chances for positive environmental outcomes. Furthermore, our findings indicate that short duration WWT activities based on a single charismatic megafauna species have the potential for environmental outcomes. This finding may be useful to managers of national parks and other wildlife areas when deciding what WWT activities to allow. In areas with vulnerable species, it may not be possible to offer long duration or frequent WWT activities. Our study shows that a short duration guided wildlife watching experience may be a good option in these cases, as musk ox safaris typically lasted four to five hours and still had positive relationships with participants’ intentions to perform pro-environmental actions. Future guiding and product development should focus on fostering high involvement from participants and aim to foster positive attitudes toward environmental behaviors and affect participants’ subjective norms, as both centrality to life and musk ox safari participation’s indirect effects through these dimensions were greater than its direct effects.

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