'Travel light, leave your cognitive dissonance behind?'
A new framework for understanding cognitive
dissonance in the context of polar tourism

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Abstract

More and more people are travelling to the polar regions (i.e., the (Ant)Arctic). Studies show many of these people highly care for nature and are motivated to visit the regions to be close to nature, but in doing so, they paradoxically harm this very same environment. It is therefore important to gain insights in why people increasingly engage in these harmful travels despite their pro-environmental beliefs. We examined if this paradox can be explained on a cognitive level, by dissecting people's biospheric values into an anthropocentric attitude (i.e., nature has instrumental value) and an ecocentric attitude (i.e., nature has intrinsic value). Ecocentric attitudes were expected to make people experience cognitive dissonance about their travel behaviour, whereas anthropocentric attitudes would act as a buffer. In turn, this arising dissonance was expected to be related to the debated concept of engaging in ambassadorship behaviours. A questionnaire among customers of a Dutch travel agency (N = 325) revealed that people engaging in polar tourism strongly endorse biospheric values, and hold both, anthropocentric attitudes and ecocentric attitudes. In explaining the pathway to experiencing cognitive dissonance, ecocentric attitudes appeared to have a significant relation with feeling dissonant emotions, whereas anthropocentric attitudes did not buffer the dissonance. In turn, the experience of cognitive dissonance was found to be related to travellers engaging in ambassadorship behaviours upon arrival back home. This suggests that cognitive dissonance can play an important role in explaining people's harmful travel behaviour to the polar regions and consequent ambassadorship behaviours.

Keywords: polar tourism, cognitive dissonance, ambassadorship, biospheric values, ecocentric attitudes, anthropocentric attitudes

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The polar regions, (i.e., Antarctica and the Arctic), are characterized by pristine nature with sensitive environmental conditions that are directly harmed by global climate change (Müller & Viken, 2017; Wang et al., 2020). The poles are strongly affected by climate change and warming twice as fast compared to the rest of the world (Intergovernmental Panel on Climate Change (IPCC), 2007; Snyder et al., 2007; Meredith et al., 2019). They react more intensely and rapidly with recent years showing various trends in warming and negative impacts on sea ice, permafrost and biota (Anisimov et al., 2007; Meredith et al., 2019). Nonetheless, more and more tourists are engaging in polar tourism by travelling to the Antarctic and Arctic regions (Hall & Saarinen, 2010; Liggett et al., 2011; Wang et al., 2020; Hovelsrud et al., 2023). Over the past ten years, the number of tourists visiting Antarctica has increased by more than 200% (International Association of Antarctica Tour Operators (IAATO), 2013; IAATO, 2023). Growing numbers of tourists are also seen in Arctic countries, such as Norway, Sweden, Finland and Iceland (Øian et al., 2018).

Unlimited tourism development and climate change are seen as interrelated with irreversible and harmful outcomes for the polar environments (Wang et al., 2020). Polar tourism is often associated with long-distance travels to remote areas, that are primarily accessible via airplane and produce large numbers of greenhouse gas emissions (Dawson et al., 2011; Gössling et al., 2023). For example, a trip to view polar bears in Churchill for five days or receding glaciers in Antarctica for 21 days can contribute up to 8.61 and 15 tons of carbon dioxide (t/CO_2) per person per trip, respectively (Amelung & Lamers, 2007; Dawson, et al., 2011). Even though the average emission rate of an individual living in the Netherlands is 7.5 t/CO_2 annually (The World Bank, 2023). Lenzen et al. (2018) measured tourism to be responsible for 8% of warming from CO_2 and other greenhouse gasses.

The travels facilitating tourists to experience the nature of the Arctic and Antarctic are endangering this natural environment at the same time (Dawson et al., 2011). For example, on-site tourists distribute plastic pollution or other types of litter, carry invasive non-native plant species on their clothing, and the cruise ships present produce waste and air pollution (Stonehouse & Snyder, 2007; (Lück et al., 2010; Fuentes-Lillo et al., 2017; Ibañez et al., 2020; Liggett et al., 2023). On a global level, the carbon emissions from travelling to the polar regions significantly contribute to climate change (Scott et al., 2010).

Yet, despite these numerous negative impacts on the polar regions caused by travelling, the tourism sector is not expected to slow down but will contrarily keep on showing high growth rates in the future (World Tourism Organization (UNWTO), 2023). This study therefore seeks to explore why people keep travelling to the polar regions, despite the negative environmental impact of these trips.

Biospheric values

Do people who travel to the remote polar regions simply not care about nature and the environment? The evidence suggests the contrary. Scientific literature and tourism agencies mention the experience of nature as the main motivation of tourists visiting the (Ant)Arctic. For example: Tourism of Iceland notifies that an estimated 80% of all tourists come to see their natural attractions (Øian et al., 2018). Tourists visiting Longyearbyen, Spitsbergen are primarily coming for the offer of nature-based activities and the unspoiled environmental attractiveness of the archipelago (Aldao & Mihalič, 2020). Eijgelaar et al. (2010) add to this by stating that, 90% of the tourists going to Antarctica mention 'natural experiences' as their main reason for visiting. To better understand this motivation to travel for nature we can look at people's values, as they are recognized as the precursors for motivational processes (Parks & Guay, 2009).

In general, values refer to a guiding principle in someone's life that steer one's

behaviour towards a desired end-state (Schwartz, 1992). Values thus play a significant role in predicting people's attitudes and behavioural intentions (Stern & Dietz, 1994; Stern, 2000). Especially biospheric values are primarily acknowledged for playing a relevant role in predicting the environmental beliefs and pro-environmental behaviours of individuals (Bouman et al., 2018; De Groot & Steg, 2007). Individuals who endorse biospheric values feel an internal obligation to base their behavioural decisions on minimally impacting the natural environment (Stern et al., 1998; Steg et al., 2012; Landon et al., 2018). Biospheric values underlie more specific attitudes and beliefs towards different environmental topics, therefore attitudes can also serve as indicators of a person endorsing biospheric values and consequently predicting pro-environmental behaviours (Steg & de Groot, 2012). With pro-environmental behaviours we refer to consciously acting in a manner that minimizes the negative impact of people's behaviour on our planet (Kollmuss & Agyeman, 2002). Besides acting pro-environmentally, individuals with biospheric values show a commitment to protecting nature regardless of whether they will directly benefit themselves (Steg & de Groot, 2012). Additionally, biospheric values can be predictive of awareness in general about environmental problems (Steg et al., 2005). This can include climate change beliefs, such as worries, concerns or risk perceptions (Hornsey et al., 2016). Schwartz et al. (2012) suggest that the more important and prioritized this biospheric value is perceived to be for an individual, the stronger its influence will be on one's beliefs, attitudes and actions.

Biospheric values and polar tourism

When placing this in the context of polar tourism, previous studies demonstrate that specifically people who endorse biospheric values, and by extension have corresponding attitudes and views, paradoxically travel to pristine and vulnerable nature. For example, tourists with a personal commitment to nature protection and conservation prefer tourism where nature is the focus of the experience (Perkins & Brown, 2012). Luo and Deng (2007)

found that tourists who show high concerns about climate change, also aspire more to be near nature. Furthermore, the literature indicates that tourists who are the most motivated to visit vulnerable landscapes and disappearing natural sites (last-chance tourism destinations) are at the same time, the most worried about climate change (Piggott-McKellar & McNamara, 2016; Lemelin & Whipp, 2019; Denley et al., 2020). Salim & Ravanel (2020) add to this by stating that the more tourists are aware of the human influence on climate change, the more tourists wish to see a disappearing glacier, regardless of the emissions generated through their travels there. Additionally, the same individuals who strongly care about nature and make environmentally conscious choices in their everyday lives, continue going on environmentally harmful vacations (Juvan & Dolnicar, 2014; Juvan & Dolnicar, 2021). This is confirmed again by the findings of Barr et al. (2011) who found that people who are behaving pro-environmentally at home, engage in the longest and most frequent flights. The above literature shows that those who highly care for protecting the environment (endorsing biospheric values), still make unsustainable decisions for their vacations and consequently harm the environment in the process. This indicates that people's beliefs and travel behaviour are not aligned, which would normally cause people to either change their beliefs or behaviour (Juvan & Dolnicar, 2014). Apparently, this is not happening in the context of polar tourism, therefore highlighting the need to further investigate this paradoxical matter.

Anthropocentric and ecocentric attitudes

This study proposes that the paradox of people with strong biospheric values travelling to vulnerable nature can be better understood by providing a more nuanced comprehension of the biospheric value construction. We propose that within biospheric values there may be two specific yet different attitudes, namely ecocentric and anthropocentric values. Attitudes are constructs that, like values, are used to explain behaviour (Xu & Fox, 2014). Attitudes derive from values and are therefore narrower (Ajzen & Fishbein, 1980; Grob, 1995; Hanel et al.,

2021). In general, they can be described as positive or negative evaluations of something based on emotion and cognition (Ajzen & Fishbein, 1980; Grob, 1995). Two distinct attitudes in relation to the natural environment are recognized, namely anthropocentric and ecocentric attitudes (Xu & Fox, 2014). Both attitudes evaluate nature protection positively, but they are distinguishable in their reasonings for supporting nature preservation (Thompson & Barton, 1994).

Anthropocentric attitudes relate to appreciating nature because of what it can contribute to human wellbeing and human needs (Thompson & Barton, 1994). From the anthropocentric perspective, nature has an instrumental value in satisfying human preferences (Himes et al., 2023). People with anthropocentric attitudes highly value the interaction between humans and nature but because anthropocentric attitudes are human-centred, these attitudes will less likely lead to environmental conserving behaviours if other human-centred interests interfere (Thompson & Barton, 1994). Therefore, it can be expected that people with anthropocentric attitudes will place their own wellbeing above those of nature when they want to travel far to the polar regions to be surrounded by pristine nature.

Endorsing ecocentric attitudes means valuing the well-being of nature for nature's sake (Thompson & Barton, 1994; Perkins & Brown, 2012). Nature is worth protecting because it has intrinsic value independent of its worth to humans (Thompson & Barton, 1994; Kortenkamp & Moore, 2001). Ecocentric attitudes will lead to environmental support regardless of any discomfort or inconvenience that affects one's quality of life. (Thompson & Barton, 1994). This implicates that in the case of polar tourism, people would forego long harmful travels to pristine nature.

Anthropocentric - and ecocentric attitudes seem to contradict each other in their perception of the use of nature. When people let their anthropocentric attitudes lead their behaviour and go travel, this opposes their ecocentric attitude. This is in accordance with the

suggestion from Sockhill et al., (2022) who mentioned that attitudes can restrain the influence of one's values when behaving in a certain way. In our case, this would mean that anthropocentric attitudes could overrule ecocentric attitudes and provide a buffer against possible misalignments between people's attitudes and travel behaviour to the polar region.

Cognitive dissonance

Such a misalignment between beliefs and behaviour implicates travellers with strong biospheric values will experience so-called cognitive dissonance about their travel to far away pristine nature (Juvan & Dolnicar, 2014; Juvan et al., 2016; Bamdad, 2019). Cognitive dissonance arises when behaviour and attitudes don't align, leading to feelings of tension or psychological discomfort (McCarthy et al., 2021). When decisions require significant commitment or investment that are infrequent and ask for considerate deliberations (in the case of polar tourism), cognitive dissonance tends to be high (Tanford & Montgomery, 2014). Similarly, dissonance increases when there are desirable alternatives and individuals have the freedom to decide for themselves (Awa & Nwuche, 2010). These conditions apply to travel purchases, that are characterized as pleasure-based goods and not a primary necessity in someone's life (as nutrition or electricity would be) (Tanford & Montgomery, 2014).

Previous studies indeed indicate that people can experience cognitive dissonance about their travel choices. Miller et al. (2020) report that tourists who still travel, despite being concerned about the environment, feel bad about this. Moreover, environmental activists who were aware their vacations harm the environment were more inclined to adjust their beliefs than to stop travelling (Juvan & Dolnicar, 2014). This is a response in line with cognitive dissonance theory, as the accompanying state of unease is said to motivate an individual to change either their behaviour or attitude to achieve cognitive consonance again (Festinger, 1957; Festinger, 1965; Hindley & Font, 2015; De Vos & Singleton, 2020). However, it seems that the psychological discomfort, in the case of (polar) tourism, is not thus far intense to

demotivate the concerning travel behaviour (Hindley & Font, 2015). On the one hand, our model suggests that when people endorse biospheric values, ecocentric attitudes will enhance feeling dissonant, whereas their narrower anthropocentric attitudes will buffer this experience of cognitive dissonance. Besides this cognitive buffer, people may still retrospectively look for other ways to reduce the psychological tension arising from their travel. A possible compensatory technique is the phenomenon of so-called ambassadorship.

Ambassadorship

People who experience cognitive dissonance want to relieve themselves from the arising psychological tension (Festinger, 1957). This stimulates individuals to engage in compensatory behaviours to make up for the attitude-behaviour inconsistency and reduce the accompanying dissonance. An individual's willingness to compensate is proportional to the amount of experienced dissonance (Lavergne & Pelletier, 2016). It has recently been suggested that the experience of polar tourism makes people behave more pro-environmental upon arrival back home, i.e., expressing 'ambassadorship behaviours' (Miller et al., 2020). Following up on our theoretical model, such behaviours could indicate that people are taking compensatory measures to offset their dissonance. These people, or so-called 'ambassadors', advocate for protection of the region and make positive changes in their behaviour upon arrival back home (IAATO, 2020). For example, adopt a more pro-environmentally lifestyle than before or start supporting climate change policies and encourage peers to do the same (Miller et al., 2020).

In the context of polar tourism, there is an ongoing discussion about this ambassadorship concept and potential transformative idea of travelling (Weaver, 2005; Powell et al., 2008; Eijgelaar et al., 2010; Dawson et al., 2011; Miller et al., 2020; Reas et al., 2023). However, there remains a knowledge gap regarding how travel experiences can influence such pro-environmental behavioural outcomes (Cajiao et al., 2022).

Proposed framework

The theoretical framework of this study contributes to the ongoing discussion about ambassadorship by proposing that people's continuous travels to the polar regions can be explained by dissecting people's biospheric values into (1) anthropocentric attitudes that place human interests (tourism) over nature, and (2) ecocentric attitudes that unconditionally prioritize nature conservation. We suggest that ecocentric attitudes increase feelings of cognitive dissonance about the travel behaviour, but this effect is buffered by the endorsed anthropocentric attitudes. In turn, the persistent dissonance about people's travel behaviour will be related to engaging in ambassadorship behaviours. Deriving from this, our study will try to answer the main question: 'How can we explain the paradox of people's harmful travel behaviour to the polar regions, while they concurrently express relatively high concerns for nature and the environment?'

From this the hypotheses are as follows (see figure 1 for the theoretical model):

Figure 1.

Theoretical model
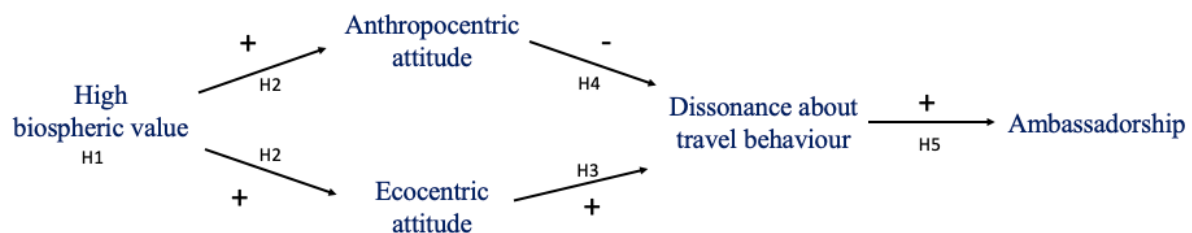
i. People who travel to the polar regions express strong biospheric values.

ii. Biospheric values are positively correlated to anthropocentric attitudes as well as to ecocentric attitudes towards nature.

iii. People expressing high ecocentric attitudes will experience more cognitive dissonance about their travel behaviour.

iv.   People expressing high anthropocentric attitudes will experience less cognitive dissonance about their travel behaviour.

 v.   When people experience cognitive dissonance about their travel behaviour, they will take on ambassador roles upon arrival back home.

Method

Participants and procedure

This study consists of an online questionnaire disseminated among the customer base of a Dutch travel agency that specialises in travels to nature destinations, in particular to the Arctic and Antarctic regions. Therefore, their travels qualify as polar tourism (Hall & Saarinen, 2010). Destinations include Alaska, the Faroe Islands, Greenland, Lapland, Norway, Spitsbergen, Antarctica, Finland, Iceland, Sweden and Canada (Askja Reizen, n.d.). The questionnaire was distributed via the newsletter of the travel agency and could be completed using any type of mobile device or laptop (see Appendix A for the invitation). Data collection took place starting from the 12th of April 2024 until the 6th of May 2024. Participation was on a voluntary basis. To incentivize participation, three sets of travel accessories (a backpack and packing cube) were raffled among participants who completed the survey and consented to participation in the raffle.

In total 547 Dutch participants participated in the questionnaire. There were 14 participants who did not agree to participate in the study, and 125 participants who did not start the questionnaire (non-complete). Additionally, we handled a progress of $> = 66\%$ minimum completion rate for the participants to be included in the final dataset. This led to the exclusion of 64 participants. There were 19 participants who indicated travelling to a destination that does not qualify for polar tourism (e.g., Scotland), therefore we excluded these participants as well. The final number of participants used in our study was 325. Participants were on average 60 years old, ranging from minimum 19 years and maximum 85

years (SD = 11.60). In our sample, 52.6% identified as female, 42.8% as male and 0.3% indicated ''other'' (missing responses 4.3%).

Our questionnaire was constructed with the software *Qualtrics* (2005). Every person who has booked with the travel agency and subscribed to their mailing list received an invitation. Conditions of participation included being 18 years or older and having a travel history or scheduled travel with the travel agency in the near future. Starting the questionnaire, the participants were first presented with the informed consent form. After agreeing with participation, the substantive questions of the study began. The questionnaire consisted out of a mixture of questions with relevance to the framework of our study and questions that were of commercial interest to the travel agency. This combination of commercial and academic interests was possible due to finding common ground in broadening knowledge about sustainability in the context of tourism. No further elaboration will be provided on the questions with specific relevance to the travel agency. This study has been approved by the Ethical Committee of the University of Groningen (Faculty of Behavioural and Social Sciences).

Measures

For analysing the data from the questionnaire, a correlational design was conducted using the statistical program IBM SPSS Statistics (Version 28).

Biospheric values

Biospheric values were measured using the Environmental-Portrait Value Questionnaire (E-PVQ). The E-PVQ is a less abstract way of asking about respondent's value orientations and is therefore perceived as easier to complete and understand (Bouman et al., 2018). To make the questionnaire more compact, we included two of the four items measuring biospheric value orientations that showed the highest factor loadings: *'It is important to me to protect the environment'* and *'It is important to me to prevent*

environmental pollution'. Participants indicated to what extent they agreed with the value

items on a 7-point Likert scale ranging from *1-Totally disagree* to *7- Totally agree (M* = 6.14*,*

SD = 0.80*, alpha* = .84*)*

Anthropocentric attitudes and ecocentric attitudes

We constructed our own items to measure anthropocentric attitudes and ecocentric

attitudes, because we could not find an existing questionnaire that was specific and

differentiating enough for our study. The developed items contradict one another in their

perception of the function of nature, which is in line with our model. Anthropocentric

attitudes reflect thinking nature is important because of its instrumental value to satisfy human

preferences, whereas ecocentric attitudes represent thinking nature is important because of its

intrinsic value independently of its usefulness to human beings (Himes et al., 2023). This

resulted in three items measuring the anthropocentric mindset and three items representing the

ecocentric mindset (see Table 1).

Table 1.

Scale items for measuring anthropocentric attitudes and ecocentric attitudes.

Anthropocentric attitude	Ecocentric attitude
Anthro1= 'Nature is there for the wellbeing of humankind'	*Eco1*= 'Nature deserves to be protected, even if it does not benefit people or society'
Anthro2= 'Humans should spend more time in nature'	*Eco2*= 'In a natural environment, the needs of animals and plants are more important than the needs of humans'
Anthro3= 'Everyone should have the right to enjoy pristine nature'	*Eco3*= 'Nature should become less accessible to humans'

Testing the reliability of both their scales revealed our generated items consistently measure the same construct and have a significant contribution with *alpha* = .49 for the anthropocentric attitude items and *alpha* = .62 for the ecocentric attitude items. Additionally, all items showed to be of added value to the overall model as Cronbach's alpha went down if one of the items would be deleted (see Appendix B). Inter-item correlations from both scales were low ranging from -.010 to .443 (see Appendix C). Participants indicated to what extent they agreed with the statements on a 7-point Likert scale ranging from *1- Totally disagree* to *7- Totally agree.*

Cognitive dissonance

In the literature there are no straightforward methods or scales used for measuring cognitive dissonance, suggesting the measurement to be dependent on the context in which it occurs (Edenbrandt, 2021). In our questionnaire, we measured cognitive dissonance using two different approaches. These approaches are in line with Festinger (1957), who on the one hand defines cognitive dissonance as a misalignment between attitudes and behaviour, and on the other hand, indicates that this mismatch arouses psychological discomfort.

First, we asked respondents to what extent they believe their travel has a negative impact on the environment. This question was aimed to sketch a picture about whether travellers perceive their travels to be harmful to the environment. We expect this to be a precursor for experiencing cognitive dissonance about travelling when people earlier on in the questionnaire indicated that they consider protecting the environment is important via the biospheric value items. The wording of the questions was inspired by the post-decision dissonance scale from Koller and Salzberger (2007): *'In addition to the positive effects of travel, travel can also have negative impacts on the environment. To what extent do you believe your travel has a negative impact on the environment?'* Participants could rate the extent to which they believed their travel negatively impacts the environment on a 5-point

Likert scale derived from the Positive and Negative Affect Scale (PANAS), ranging from *1- Not at all, 2- A little, 3- Moderately, 4- Quite a bit, 5- Extremely.*

Second, cognitive dissonance is mostly described in the literature as an uncomfortable feeling or feelings of psychological tension (e.g., Festinger, 1957). To explicitly capture this description in our questionnaire, we asked respondents to what extent they felt (1) uncomfortable, (2) uneasy, or (3) a mixed feeling when thinking about the environmental impact of their travel. These three were specifically chosen based on the literature repeatedly mentioning these ambivalent feelings occurring among individuals experiencing cognitive dissonance. The PANAS scale was used again for the answer options, for which participants could separately rate the extent to which they experienced the above-named three feelings (*M* = 2.24, *SD* = 0.94, *alpha* = .89).

Ambassadorship

As ambassadorship is still a relatively new concept in the literature, the items measuring ambassadorship were derived from a forthcoming work on Antarctic ambassadorship behaviour (Kumar et al., forthcoming). In total, we asked the participants about five different ambassadorship behaviours (see Appendix D for the items) that distinguished between private sphere behaviour, political engagement, and everyday environmental activism. In our study, we examined these different types of behaviours as one scale. Participants were asked the following 'As a result of your (scheduled) trip, are you planning to take the following actions, or have you already done so?'. For each of the different types of behaviours, participants indicated: 1- *Definitively not planning to do this* 2- *Probably not planning to do this* 3- *Probably planning to do this* 4- *Definitely planning to do this* 5- *Already done this* (*M* = 3.24, *SD* = 0.86, *alpha* = .72).

Results

Biospheric values

We first examined whether our participants (N = 325), score high on the items measuring biospheric values. This is a prerequisite of our model that aims to dissect one's biospheric values into an anthropocentric biospheric attitude and ecocentric biospheric attitude. On average, participants scored $M = 6.14$ ($SD = 0.80$, $min = 1$, $max = 7$) on the biospheric values scale meaning that on average they 'agree' with the items. The maximum score of 7 was chosen by 32.78% of the participants. These high mean scores suggest that almost everyone from our sample endorses strong biospheric values. This confirms our first hypothesis that people who travel to the polar regions express strong biospheric values.

Relation between biospheric values, anthropocentric attitudes and ecocentric attitudes

After confirming that our sample endorses strong biospheric values, we analysed whether the overarching biospheric value is correlated to the more specific anthropocentric attitudes ($M = 5.53$, $SD = 0.96$, $min = 1$, $max = 7$) and ecocentric attitudes ($M = 5.48$, $SD = 0.88$, $min = 1$, $max = 7$). The individual mean scores for the items measuring the attitudes can be found in Appendix E. A positive non-significant relation was found between biospheric values and anthropocentric attitudes ($r = .11$, 95% CI [-0.00, 0.21], $p = .057$). This illustrates that stronger biospheric values are weakly related to the endorsement of anthropocentric attitudes. In turn, the results do show a positive significant relation between ecocentric attitudes and biospheric values ($r = .32$, 95% CI [0.21, 0.41], $p < .001$), showing that people with strong biospheric values increasingly endorse ecocentric attitudes. The results reveal that when narrowing down the overarching construct of biospheric values, ecocentric attitudes are positively related to biospheric values, but this relation was found marginally insignificant for anthropocentric attitudes, therefore partly confirming our second hypothesis

Capturing cognitive dissonance

Environmental impact of travelling

To capture cognitive dissonance occurring in the context of polar tourism, it is important to validate whether our participants are aware of the harmful impact of their long travels to pristine nature. On average our participants scored 'moderate' when asking them about the extent to which they think their travel negatively impacts the environment (M = 2.95, SD = 0.80, min = 1, max = 5). See Appendix F for the frequencies of other answers given. There appeared to be a positive significant relation between ecocentric attitudes and thinking one's travel negatively impacts the environment (r = .27, 95% CI [0.16, 0.37], p < .001). This shows that the stronger people endorse ecocentric attitudes, the more likely they are to acknowledge the negative environmental impact of their trip. Moreover, the results displayed a non-significant negative relation between anthropocentric attitudes and thinking one's travel negatively impacts the environment (r = -.03, 95% CI [-0.14, 0.08], p = .566). This means the endorsement of anthropocentric attitudes is weakly related to recognizing the negative environmental impact of one's trip. Overall, these results show our sample moderately thinks their travel negatively impacts the environment and this effect is especially found for people expressing ecocentric attitudes.

Dissonant emotions

To further confirm cognitive dissonance occurring among our participants, three different dissonant emotions of psychological tension were measured in the questionnaire. The average score of having uncomfortable, burdened, and mixed feelings across the sample was 2.24 (SD = 0.94, min = 1, max = 5). The mean scores for each individual feeling were relatively similar (see Appendix G). Moreover, there appeared to be a strong significant relationship between thinking one's travel has a negative impact on the environment and feeling dissonant emotions about this same travel (r = .48, 95% CI [0.40, 0.56], p < .001). This confirms that the more someone thinks their travel to pristine nature harms the environment, the more uncomfortable, burdened and mixed feelings they experience about

their travel behaviour. The relation with dissonant emotions was especially found for participants with high ecocentric attitudes ($r = .36$, 95% CI [0.26, 0.45], $p < .001$) and not for participants with high anthropocentric attitudes ($r = -.03$, 95% CI [-0.14, -0.08], $p = .557$). This illustrates that in the context of polar tourism, people with specifically ecocentric attitudes, but not anthropocentric attitudes, are particularly prone to experiencing cognitive dissonance about their travel behaviour, confirming our third hypothesis. Yet, our hypothesis that anthropocentric attitudes would be negatively related to cognitive dissonance, was not supported. Suggesting that endorsing anthropocentric attitudes does not provide a cognitive buffer against the experience of cognitive dissonance.

Ambassadorship

After establishing that there is a moderate amount of cognitive dissonance experienced among our sample of participants travelling to the (Ant)Arctic, we looked at whether this dissonance, in turn, is related to ambassadorship behaviours. The results reveal a positive significant relation between participants exhibiting ambassadorship behaviours and experiencing dissonant emotions ($r = .40$, 95% CI [0.31, 0.49], $p <.001$). When separately evaluating the correlations of people who already went on their travels and experiencing dissonant emotions ($r = .41$, 95% CI [0.30, 0.50], $p <.001$) and people who still have to departure for their travel ($r = .45$, 95% CI [0.15, 0.67], $p =.004$), the results implicate similar relationships with the experience of dissonant emotions (see Appendix H for the descriptive statistics). The results imply that the act of engaging in ambassadorship behaviours is similar across people who have already travelled to the polar regions and people who have yet to depart. Altogether, the results show that when people experience cognitive dissonance over their travels to the polar regions, they will take on ambassador roles upon arrival back home, and therefore our final hypothesis is accepted.

Discussion

Over the past years, there has been an exponential increase in the number of tourists visiting the polar regions, which simultaneously harms this vulnerable environment (Wang et al., 2020). The main research question we aimed to answer is why people who care about protecting nature, engage in the environmentally harmful behaviour of travelling to the polar regions. In an attempt to solve this paradox, we found that people who strongly endorsed biospheric values (H1), displayed a strong effect size in relation to ecocentric attitudes, whereas the anthropocentric attitudes surprisingly appeared to be marginally insignificant (H2). In turn, we found that specifically ecocentric attitudes cause people to experience cognitive dissonance about their travel behaviour (H3), whereas the expected relation with anthropocentric attitudes in buffering the experienced dissonance (H4) was not found. Furthermore, the results show that when cognitive dissonance arises, people increasingly engage in ambassadorship behaviours (H5). Such ambassador behaviours incorporate acting more pro-environmentally in daily life upon arrival back home than before the travel (Miller et al., 2020). We will reflect on the results in twofold, first on cognitive dissonance in relation to cognition (i.e., values and attitudes) and thereafter on cognitive dissonance in relation to compensatory behaviours (i.e., ambassadorship).

Reflecting on biospheric values, anthropocentric attitudes, and ecocentric attitudes

As expected, our results show that people travelling to the polar regions have strong biospheric values, replicating previous studies that demonstrate tourists travelling to the (Ant)Arctic have a personal commitment to nature protection and conservation (Perkins & Brown, 2012). Our results also replicate existing research, by providing evidence for the attitude-behaviour gap occurring in the context of polar tourism, through showing that the people who strongly endorse biospheric values, paradoxically travel to vulnerable and pristine nature. The existing literature implies that biospheric values are the most common assessment

for measuring how much a person cares for nature, moreover values are said to transcend specific situations (Schwartz, 1992; Steg & De Groot, 2012). Therefore, biospheric values should have been predictive of pro-environmental behaviours, even in the context of polar tourism. This was not reflected in our research findings. Nielsen et al. (2021) mention that pro-environmental behaviours scales systematically neglect infrequent behaviours with large environmental impacts; in our case travel purchases. This aligns with our study that extends previous research by showing that biospheric values are too much of an overarching construct for explaining pro-environmental behaviour when it comes to more context-specific behaviours, like travelling to the (Ant)Arctic. This implies that pro-environmental behaviour scales should indeed become more considerate of behaviours with large environmental impact, like travelling, especially as biospheric values are shown to be an inaccurate predictor in the context of polar tourism.

To provide a deeper understanding of why people keep travelling to the polar regions despite endorsing high biospheric values, we proposed a dissection into anthropocentric attitudes and ecocentric attitudes. The results imply that thinking nature has worth independent of what it can contribute to humankind (ecocentric attitude) is a better fit for elaborating on people's biospheric values than thinking nature has worth because of what it can offer humankind (anthropocentric attitude). This aligns with previous research that recalls people with ecocentric convictions are relatively more connected to nature than those with a more dominant anthropocentric perspective (Stern & Dietz, 1994). When following up on our theoretical model and evaluating the experience of cognitive dissonance, the strongly endorsed biospheric values are in itself already a clear indication for cognitive dissonance to occur, since beliefs and behaviour are not aligned. When narrowing this down to see how the distinct attitudes relate to experiencing dissonance, the first pathway of ecocentric attitudes in relation to experiencing cognitive dissonance was found to be positively significant, while the

anthropocentric attitude pathway was not. The results show that the manifestation of dissonant emotions is enhanced by endorsing ecocentric attitudes but the dissonance is not buffered, as expected, by endorsing anthropocentric attitudes. This implies that cognitive dissonance is not compensated for via different attitudes towards nature on the cognitive level but is reduced in another way.

Methodological limitations

In addition, the operationalization of our scales measuring biospheric values and anthropocentric – and ecocentric attitudes needs to be considered when interpreting the results. We used broad statements for measuring biospheric values (reflecting that values are more overarching, transcendent constructs), and used more detailed items for measuring the attitudes. Participants generally agreed more with the subtle phrased items compared to the strongly phrased statements. The strongly phrased items were more extreme in their perception on the function of nature. For instance, the most direct anthropocentric item states, 'Nature is there for the wellbeing of humankind' and the most direct ecocentric item was 'Nature deserves to be protected, even if it does not benefit people or society'.

We analysed correlations for each of the attitude scales, rather than for individual items. However, when evaluating the items on an individual level it appeared that the more strongly phrased the items, the weaker the correlations. A significant correlation between the biospheric values scale and an individual item measuring ecocentric attitudes as high as $r = .49$ was found (this item was the most subtle phrased in terms of nature perception). This can be explained by Schwartz (2005) who mentions that a direct approach to asking people about their beliefs is likely to make responses susceptible to self-enhancement bias. This occurs because certain beliefs and consequently answers may be perceived as more socially acceptable than others, therefore generating lower scores for these items than for the subtle phrased items. In addition, participants tend to exaggerate their pro-environmental intentions

in general, likewise in the context of sustainable consumption behaviours or attitudes (Durmaz et al., 2022). This could be reflected in the biospheric value items reaching a ceiling effect and consequently resulting in relatively lower scores on the anthropocentric and ecocentric items (Nilsson et al., 2016). As this is the first time our items were used to measure anthropocentric and ecocentric attitudes, more research is needed to validate these items and finetune their construction.

Future research

For future research it would be interesting to see how high the participants score on the other dominant value orientations (altruistic, hedonic and egoistic values (Bouman et al., 2018)). Especially hedonic values could be interesting, as this value is pleasure-oriented and plays a key role in consumer behaviour (relevant for the context of tourism) (Steg et al., 2012). Hedonic values are important in explaining the psychological mechanisms that guide individual decisions, especially in a nature-based setting, where decisions are steered by leisure pursuits (Van Riper et al., 2018). In line with goal framing theory, which poses different goals may dominate in different situations in stimulating specific behaviours, a hedonic goal frame could be relevant when people go on a holiday, whereas the other goal frames might not (Canto et al., 2022). Often only one goal can dominate the cognitive processes (Lindenberg & Steg, 2007). Which goal is labelled as ''the dominant one'' is determined by people's values (Steg et al., 2016). Future research could examine people's goal frames and whether hedonic values are strongly endorsed among people visiting the polar regions.

Since anthropocentric attitudes were unsuccessful in providing a satisfactory explanation for buffering the experience of cognitive dissonance, future research could use an alternative for the anthropocentric attitudes in our model. In this study, we mainly focussed on values and attitudes that were nature-focussed but what if there are other motives for people to

visit the polar regions that perhaps play a more significant role in explaining the paradox and associated dissonance? A possible alternative for this could be investigating people's motivations. Motivation is often described in the scope of a desire for satisfying one's needs (Kim et al., 2015). Anthropocentric attitudes represent the view of people visiting the polar regions for their own sake to be in nature, but there is a fair chance that people will also have different reasons for their travel behaviour to the poles. Examples of common studied leisure motivations are to escape, to enhance relationships, novelty and relaxation (Dillard & Bates, 2011). These leisure motivations do not reflect a nature-related motive like the anthropocentric attitude pathway did, yet possibly have a greater impact on buffering the experience of cognitive dissonance.

Reflecting on cognitive dissonance and ambassadorship

When we continue to analyse our theoretical model and focus more closely on cognitive dissonance, the results of how much people think their travel negatively impacts the environment and experience dissonant emotions, yielded moderate scores. These results extend previous research (e.g., Juvan & Dolnicar, 2014; Juvan et al., 2016; Bamdad, 2019), by explicitly showing that dissonant emotions (i.e., uncomfortable, burdened and mixed feelings) are experienced among people travelling to the polar regions. This significantly implies that cognitive dissonance is occurring in the context of polar tourism. Therefore, people first need to justify their travel behaviour to themselves before they are able to travel to the (Ant)Arctic.

However, in line with Festinger's (1957) theory of cognitive dissonance we would expect a more dominant presence of dissonant emotions, instead of the average 'moderate' score stemming from our sample that strongly endorses biospheric values. These moderate results are even more so surprising, as the literature poses that dissonance is stronger when the behaviour is not obligatory, alternatives are present and the decision requires significant commitment or investment, which is the case for travel behaviour (Awa & Nwuche, 2010;

Tanford & Montgomery, 2014). Additionally, our results indicated that the expected buffering effect from anthropocentric attitudes on cognitive dissonance was not occurring, meaning that according to our model, it would be expected that people score relatively higher on the dissonant emotion items.

The moderate scores can be explained by the possibility that dissonance reduction has already taken place in another way, by the time the participants filled out our questionnaire. As mentioned before, people who experience cognitive dissonance try to reduce their induced psychological tension to achieve cognitive consonance and make beliefs and actions congruent again (Festinger, 1957; Stone & Taylor, 2021). Previous research mentions that the quickest solution would be to change one's behaviour, but in practice it has been shown that when people are unable to change their behaviour (as they keep on travelling), people will try to find alternative methods (Stone & Taylor, 2021). A literature review on dissonance reduction strategies mentions multiple other actions to achieve cognitive consonance, such as self-affirmation, distraction, trivialization and denial of responsibility and compensatory behaviours (McGrath, 2017). All these dissonance reduction strategies could possibly have been used by our participants with strong biospheric values to rectify travelling to the polar regions. For example, the average participant of our study thinks their travel only harms the environment 'a little bit', which is in line with Festinger (1957) mentioning that cognitive consonance can be achieved through avoidance of inflicting the situation and accompanying information.

Another possible compensatory technique to reach cognitive consonance is reflected in the final construct of our framework: ambassadorship behaviours. The results show that the more people feel dissonant emotions about their travel, the more they start expressing ambassadorship behaviours upon arrival back home. This not only applies to people who had already returned from their trip, but also to people who had yet to leave for their travel to the

(Ant)Arctic. Up until now, previous research assumed ambassadorship arises as a result from travel experiences with nature, such as being in close contact to nature, or getting educated about the vulnerable nature (Powell et al., 2008; Miller et al., 2020). For example, IAATO (2024) themselves recall that 'Responsible travel can create (Antarctic) Ambassadors'. However, our study shows it is feasible that the people travelling to the polar regions, and consequently are 'created' into ambassadors, did not have their eye-opening experience as a result of their travel, but their eyes were wide open all along. In line with McGrath (2017), who recalls that people who experience cognitive dissonance engage in compensatory behaviours to achieve consonance again, ambassadorship behaviours may thus serve more as a compensatory mechanism to cope with dissonance rather than stemming from experiences with nature and the environment on their travels.

Methodological limitations and future research

As this is a cross-sectional study containing participants who have already travelled to the polar regions or are going in the near future, we deal with the problem of causality. With our current study design, we are unable to discover when exactly our participants attempted to reduce their dissonance. This causality issue can be addressed by conducting a longitudinal study and measuring the extent to which people experience any dissonant emotions at different points in time (e.g., compare the intensity of dissonant emotions before booking a trip and again after they return home from this trip). In doing so, it becomes more feasible to provide a comprehensive understanding of the development of cognitive dissonance over time. Additionally, our study uses a specific sample of participants from a single travel agency, making it interesting to see how cognitive dissonance is manifested among people booking with other travel agencies and travelling to other destinations than the (Ant)Arctic. This would enable future research to sketch a clearer picture of the different contexts in which

cognitive dissonance arises and whether this phenomenon is exclusive for polar tourism or also other types of tourism.

Additional directions for the future

Deriving from our results that show people who experience cognitive dissonance about their travel behaviour engage in ambassadorship behaviours, a cautious disclaimer is in place for tourism agencies, tour operators and tourists themselves. These results do not implicate that travelling to the polar regions is justified by offering people an outlet in the form of ambassadorship. Additionally, we advise against maximising the experience of dissonant emotions about travelling to the polar regions to make people engage more in ambassadorship behaviours, as this could backfire. Making people more aware of the harmful environmental impacts of travelling and vulnerability of the polar regions can consequently make people experience more cognitive dissonance, but it could also lead to an overreaction known as reactance. This expresses itself by people wanting to travel to the (Ant)Arctic even more than before (Font & Hindley, 2016).This study is a wake-up call to show that cognitive dissonance is present among people engaging in polar tourism. Especially for this specific group of tourists, it is important to re-evaluate travel offers and consider whether it is ethical to even offer trips to such vulnerable nature destinations at all, despite the demand. Especially with the new generation of travellers, that are increasingly concerned about the environmental impact of human consumption practices being the upcoming target group (Majhi, 2020). Ultimately the socio-cultural positive effects of travelling should outweigh the negative environmental effects, in the long-term and sustained over time (Frent, 2016).

Conclusion and practical implications

In conclusion, our results show that people who travel to the polar regions express strong biospheric values, which can be narrowed down into ecocentric attitudes. These ecocentric attitudes are in turn related to experiencing cognitive dissonance over one's travels

to the polar regions. The additional buffering influence of anthropocentric attitudes on the experience of cognitive dissonance appeared to be insufficient. Moreover, this study contributes to unravelling the layers of cognitive dissonance occurring in the context of polar tourism, by illustrating that people experience dissonant emotions about their travel behaviour, which in turn is related to the occurrence of ambassador behaviours, regardless of whether people have already been on their trip. Therefore, ambassadorship behaviours are found to be a compensatory mechanism for coping with cognitive dissonance rather than a derivative of polar tourism experiences .Practically, these results mean that in trying to minimize the harmful impact of travelling to the (Ant)Arctic, experiential lessons are not going to lessen travels to the vulnerable and pristine nature of the polar regions, as people are already conscious of the importance of protecting the environment. To prevent an overabundance of tourism to the (Ant)Arctic, the role of cognitive dissonance should cautiously be taken into consideration and additional factors relating to travel behaviour and ambassadorship need to be explored. Despite ambassadorship behaviours apparent function as a moral compass to deal with cognitive dissonance, it remains crucial for everyone involved in tourism to navigate the delicate balance between exploration and preservation of the polar regions to ensure the protection of these pristine landscapes.

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Appendix A

Figure 1.

Newsletter invitation.

bekijk de nieuwsbrief in je browser

ASKJA

Bestemming | Blog | Brochure

Help Iris met haar onderzoek

Het lachende meisje op de foto hierboven is **onze stagiair Iris!** Iris studeert *Environmental Psychology* aan de Rijksuniversiteit Groningen en onderzoekt voor haar masterscriptie hoe het **thema duurzaamheid** leeft onder de Askja-reizigers. Ben je wel eens met Askja op reis geweest of staat er nog een reis gepland? Help Iris dan door haar vragenlijst in te vullen. Je bent in slechts 10 minuten klaar.

Leuk extraatje: vul je de vragenlijst in, dan maak je ook nog kans op een van de drie Askja-reispakketjes met Osprey rugzakje en pack-it cube.

Alvast hartelijk bedankt!

Klik hier om de vragenlijst te starten

We zijn ook geïnteresseerd in de mening van je medereizigers. Deel de link dus vooral!

Iris vertelt graag iets over zichzelf en haar motivatie:

"Hoi, ik ben Iris. Vorig jaar ben ik zelf met Askja op reis geweest naar Noorwegen. Dit was zo'n mooi avontuur dat ik onzettend geïnspireerd raakte. Hoe gaan duurzaam gedrag en toerisme samen? En hoe kunnen we de wereld op een verantwoorde manier ontdekken? Daar wil ik meer over weten. Door de vragenlijst in te vullen, help je mij (en Askja) om een beter beeld te krijgen van hoe jij als Askja-reiziger aankijkt tegen duurzaam reizen."

Onze bestemmingen

Alaska - Antarctica - Canada (West) - Canada (Oost) - Faeröer eilanden - Groenland - IJsland - Lapland - Noorwegen - Spitsbergen - Yukon - Zweden

Summarized translation of the newsletter invitation

'Help Iris with her research

The smiling girl in the photo above is our intern Iris! Iris studies Environmental Psychology at

the University of Groningen and is investigating for her master's thesis how the topic of

sustainability resonates among travellers of Askja. Have you ever been on a trip with Askja

before or is a trip scheduled in the future? Then help Iris by completing her questionnaire.

You'll be done in just 10 minutes.

Nice bonus: if you complete the questionnaire, you also have a chance to win one of the three

Askja travel packs with Osprey backpack and pack-it cubes.

Thank you very much in advance!

>Click here to start the questionnaire<

We are also interested in your fellow travellers' opinions, so be sure to share the link!'

Appendix B

Table 1.

Item-Total Statistics for the anthropocentric and ecocentric attitude items.

Variable	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Eco1	27.01	14.17	.33	.26	.476
Anthro1	27.69	12.28	.20	.08	.55
Eco2	27.24	13.01	.37	.25	.45
Anthro2	27.31	13.80	.30	.20	.48
Eco3	28.43	12.98	.26	.19	.50
Anthro3	27.50	12.85	.30	.24	.48

Appendix C

Table 1.

Correlations between the individual scale items measuring anthropocentric and ecocentric attitudes.

		Eco1	Anthro1	Eco2	Anthro2	Eco3	Anthro3
Eco1	Pearson Correlation	1	.027	.443**	.116*	.375**	.051
	Sig. (2-tailed)		.633	<.001	.038	<.001	.364
	N	320	320	320	320	320	320
Anthro1	Pearson Correlation	.027	1	.070	.117*	.094	.258**
	Sig. (2-tailed)	.633		.211	.036	.095	<.001
	N	320	320	320	320	320	320
Eco2	Pearson Correlation	.443**	.070	1	.147**	.352**	.127*
	Sig. (2-tailed)	<.001	.211		.009	<.001	.023
	N	320	320	320	320	320	320
Anthro2	Pearson Correlation	.116*	.117*	.147**	1	.053	.434**
	Sig. (2-tailed)	.038	.036	.009		.344	<.001
	N	320	320	320	320	320	320
Eco3	Pearson Correlation	.375**	.094	.352**	.053	1	-.010
	Sig. (2-tailed)	<.001	.095	<.001	.344		.854
	N	320	320	320	320	320	320
Anthro3	Pearson Correlation	.051	.258**	.127*	.434**	-.010	1
	Sig. (2-tailed)	.364	<.001	.023	<.001	.854	
	N	320	320	320	320	320	320

*Correlation is significant at the 0.05 level (2-tailed).
**Correlation is significant at the 0.01 level (2-tailed).

Appendix D

Table 1.

Items used to measure ambassadorship derived from (Kumar et al., forthcoming).

Private sphere behaviours	Political engagement	Everyday environmental activism
'Paying for CO^2 compensation of my travel.'	'Donating money to a charity that wants to protect vulnerable nature.'	'Sharing information on social media about the importance of environmental protection.'
'In my daily life I try to be as sustainable as possible.'		'Trying to convince others around me that protecting vulnerable nature, as I've seen on my trip, is important.'

Appendix E

Table 1.

Descriptive statistics for anthropocentric and ecocentric attitudes.

Variable	N	Mean	Standard Deviation
Eco1	320	6.02	0.93
Anthro1	320	5.34	1.67
Eco2	320	5.79	1.15
Anthro2	320	5.72	1.08
Eco3	320	4.61	1.35
Anthro3	320	5.54	1.31

Appendix F

Table 1.

Frequencies of the extent to which participants think their travel negatively influences the environment.

To what extent do you think your travel negatively influences the environment?		
	N	%
Not at all	10	3.1%
A little bit	72	22.2%
Moderate	168	51.7%
Much	63	19.4%
Very much	7	2.2%
Missing System	5	1.5%

Appendix G

Table G1.

Descriptive statistics for each individual dissonant emotion.

	N	Minimum	Maximum	Mean	Std. Deviation
Uncomfortable feeling	317	1	5	2.17	0.94
Burdened feeling	316	1	5	2.11	.97
Mixed feeling	316	1	5	2.44	1.17
Valid N (listwise)	316				

Figure G1.

Histogram of the frequencies from experiencing an uncomfortable feeling.

When you think about the environmental impact of your trip, to what extent do you experience the following feeling?

Mean = 2.17
Std. Dev. = .944
N = 322
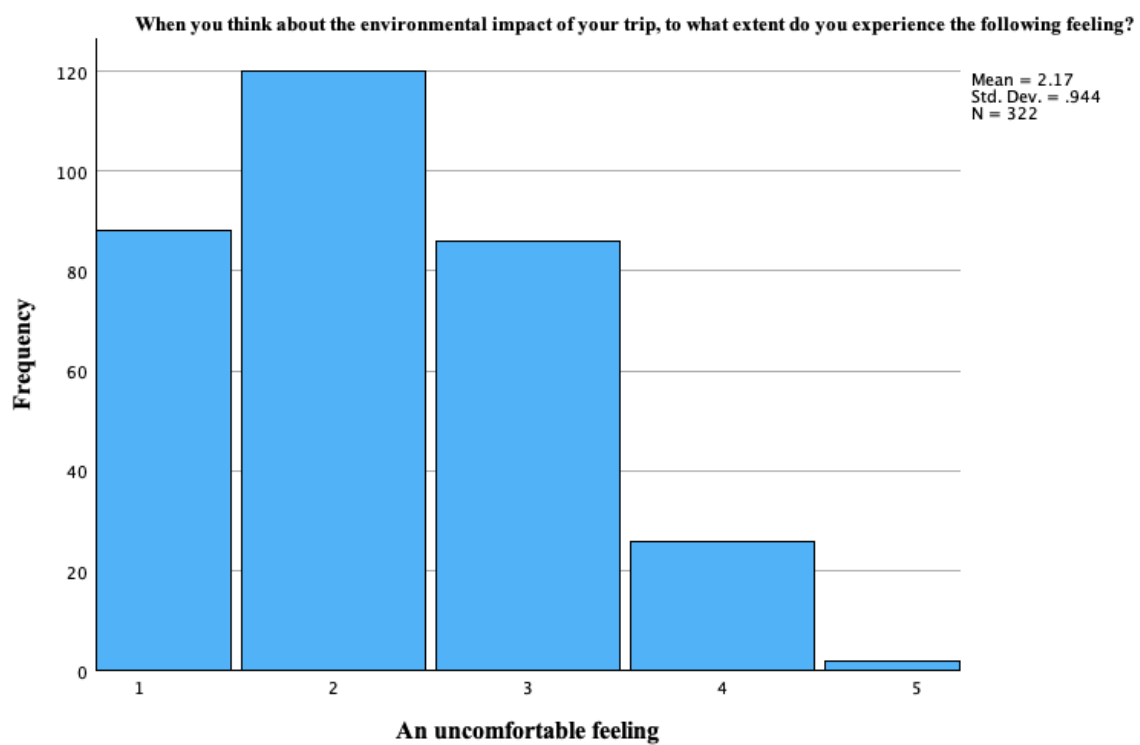
Figure G2.

Histogram of the frequencies from experiencing a burdened feeling.

When you think about the environmental impact of your trip, to what extent do you experience the following feeling?

Mean = 2.11
Std. Dev. = .968
N = 321

A burdened feeling
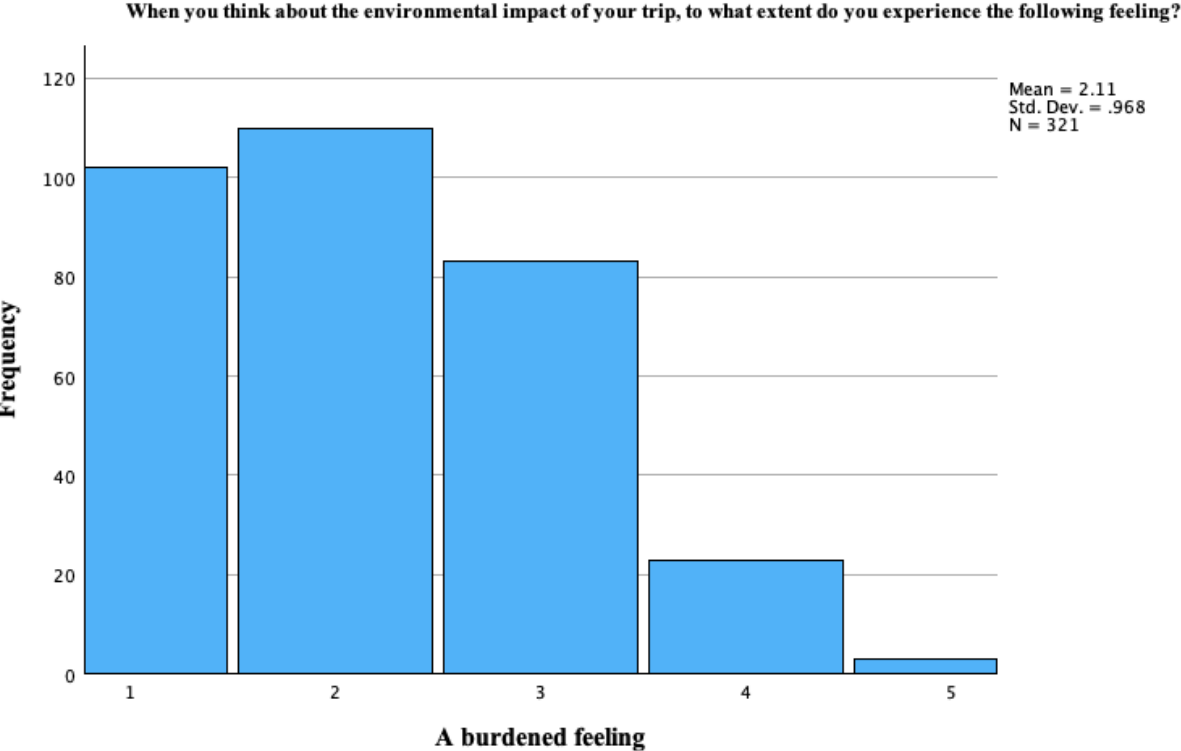
Figure G3.

Histogram of the frequencies from experiencing a mixed feeling.

When you think about the environmental impact of your trip, to what extent do you experience the following feeling?

Mean = 2.44
Std. Dev. = 1.169
N = 321

A mixed feeling
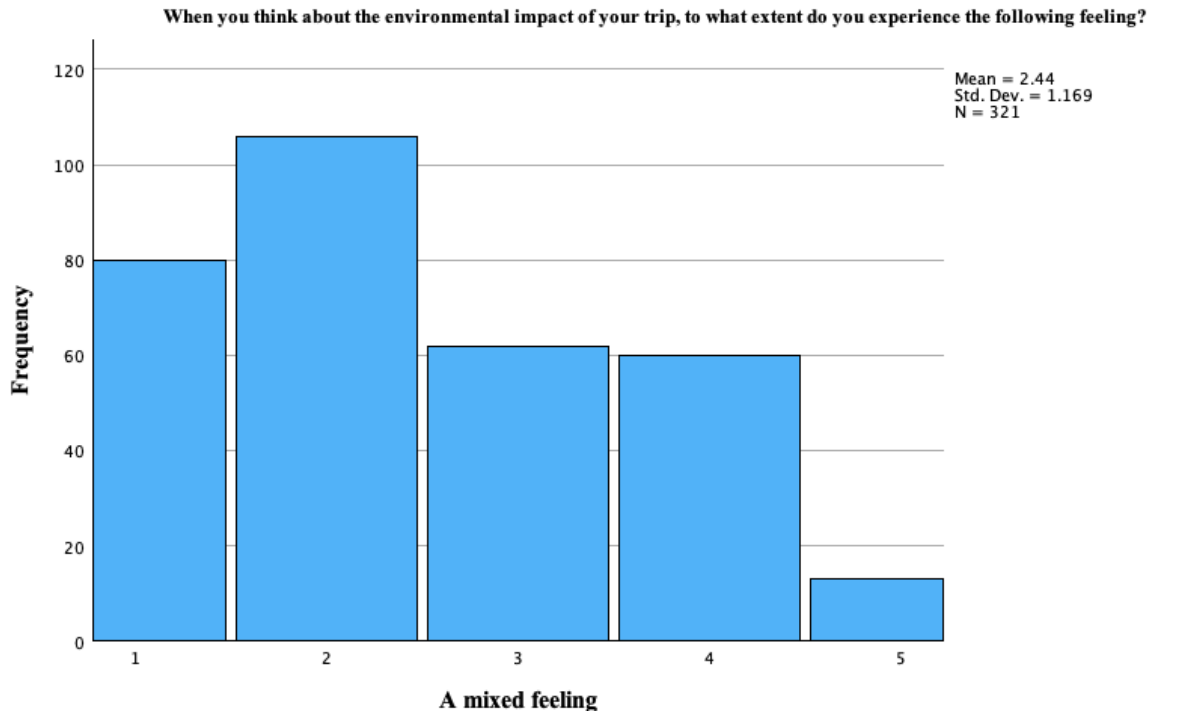
Appendix H

Table H1.

Descriptive statistics of participants who have already been on their travel.

	N	Minimum	Maximum	Mean	Std. Deviation
1.Donating money to a charity that wants to protect vulnerable nature	272	1	5	3.48	1.50
2.Trying to convince others around me that protecting vulnerable nature, as I've seen on my trip, is important	272	1	5	3.31	1.27
3.Paying for CO^2 compensation of my travel	272	1	5	3.49	1.39
4.Sharing information on social media about the importance of environmental protection	271	1	5	1.93	1.16
5.In my daily life I try to be as sustainable as possible	271	1	5	4.10	0.94
Valid N (listwise)	272				

Table H2.
Descriptive Statistics of participants who still need to go on their travel.

	N	Minimum	Maximum	Mean	Std. Deviation
1.Donating money to a charity that wants to protect vulnerable nature	38	1	5	3.63	1.40
2.Trying to convince others around me that protecting vulnerable nature, as I've seen on my trip, is important	38	1	5	3.13	1.12
3.Paying for CO_2 compensation of my travel	38	1	5	2.95	1.34
4.Sharing information on social media about the importance of environmental protection	38	1	5	1.76	1.15
5.In my daily life I try to be as sustainable as possible	38	1	5	4.05	1.01
Valid N (listwise)	38				