

Contrasting views on Antarctic tourism: 'last chance tourism' or 'ambassadorship' in the last of the wild

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ABSTRACT

Some of the suggested critical issues for Antarctic tourism include the role played by tourists as the last chance to see the icecaps before they melt, or represent potential 'ambassadors' within IAATO's (International Association of Antarctica Tour Operators) scope for self-regulation. The study also addresses the question of whether 'ambassadorship' evolves in practice from 'last chance tourism' and how it evolves. The article urges Antarctic tourism stakeholders to maintain the integrity of the ecosystem while delivering social and economic value.

We carried out in-depth interviews of stakeholders and in situ interviews of tourists visiting Antarctica, in order to explore their perceptions from an interdisciplinary perspective based on management and biology. A study of tourist and stakeholder opinions and a combination of the two methods provided a wide perspective on the 'ambassadorship' concept.

Our findings reveal that the spontaneous trust characterising ambassadorship is far removed from the perception of tour operators. While a trip to Antarctica modifies the opinions of tourists, such changes in perspective are not always favourable to ecological practices. The ambassadorship role played by tourists visiting Antarctica is unclear. This is an exploratory study that develops the debate on whether tourists should be ambassadors for the Antarctic and points to the need for self-regulation to improve stakeholder engagement in protecting the continent. We suggest that a combination of new agreements for the protection of the territory, better planning, the use of management tools, and an improvement in some educational aspects of tourism may help protect Antarctica.

1. Introduction

Tourism generates intense debate and controversy; paraphrasing Tej Vir Singh (2012): "If I were to name, in one word, what is the best and worst thing in the world, my unequivocal answer would be tourism. Made up of strong paradoxes, it offers experiences that are magnificent, spectacular, languorous, horrific, good, bad and ugly it's an experience industry". Tourism in Antarctica exemplifies this ongoing controversy and several years ago one of the experts in the field wondered: "Does tourism help or hinder the future of the Polar Regions?" (Hall, 2010).

Antarctic tourism is a relatively recent phenomenon. Although visits to the continent began over a century ago, it has only been easily practical to visit since the 1960s (Headland, 1994). It remains a small market with some 30,000 tourists a year (Hall, 2010). However, numbers are growing steadily (Lamers and Amelung, 2007; Hall and Saarinen, 2010; Powell et al., 2011) and this is likely to continue, despite the impact of the recession and the International Maritime Organization (IMO) resolution within the International Convention for the Prevention of Pollution From Ships (MARPOL) banning the use of heavy fuel on ships in the Antarctic Treaty area (ATCM, 2012). The net effect of these factors was a fall in numbers during the 2011e2012 austral summer (26,509 visitors compared with 47,225 in 2006e2007). The drop was mainly attributable to large passenger ships (>500 passengers) leaving the

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Antarctic market. Tourism grew by 8%, from 34,316 tourists in 2012-2013 to 37,405 in 2013-2014 across the various categories (total number of tourists travelling with IAATO operators to Antarctica).

The growth in Antarctic tourism over the last two decades has driven diversification in products and segments (Haase et al., 2009). The industry has grown on products based on pristine wilderness, unique and undisturbed wildlife, and dramatic landscapes – all drawing on last chance tourism as a selling point (Smith, 2008). Last chance tourism best sums up the reasons for making the trip - a chance to see the Antarctic before the icecaps melt. Antarctica is the last terrestrial wilderness, the 'last of the Wild' (CIESIN, 2002), with a unique landscape and fauna. The marketing campaign for M/V Sea Explorer speaks of "the abundant wildlife and spectacular scenery of the Antarctic Peninsula." Such 'last chance tourism' is driven by an urge to witness vanishing landscapes/seascapes and species and the need to understand why these natural wonders must be protected for their own sake and the good of mankind. These desires may have far-reaching consequences for tourism management. The paradox is that tourists want to see pristine nature before it vanishes, but by arriving in the 'wilderness' in large numbers they could be speeding its disappearance.

It has been claimed that eco-tourism positively changes the attitudes of tourists (Eijgelaar et al., 2010) and there is even talk of tourists undergoing ethical and environmental transformations (Weaver, 2005) that result in a long-term commitment to conservation (Zeppel and Muloin, 2008). This could be true in the case of Antarctic tourism. Snyder (2007) argues that the main benefit of such tourism is educational: "This can be used to not only turn visitors into 'ambassadors' for the protection of the visited regions but also into supporters of conservation activities and organizations worldwide," (Snyder, 2007).

This positive effect is known as 'ambassadorship' and was coined by Lars-Eric Linbald in his Antarctic tourism trips. His idea has been reflected in IAATO's Annual Meeting and Seasonal Statistic 2013 objectives: "Through self-regulation, Antarctic tourism is a sustainable, safe activity that causes no more than a minor or transitory impact on the environment and creates a corps of ambassadors for the continued protection of Antarctica by offering the opportunity to experience the continent first hand". 'Ambassadorship' understood as 'advocacy' was defined by Maher et al. (2003) as pressing for "the preservation of the continent [by] those who have been to 'The Ice' and so have a first-hand experience of the values to protect". However, there is little research on whether tourists returning from Antarctica act as 'ambassadors' merely by virtue of having been there. How can one make tourists act as ambassadors supporting the conservation of the natural world instead of mere voyeurs scrambling to get a last peep at a vanishing paradise?

This study focused on the concepts of 'ambassadorship' and 'last chance tourism' in studying how tourists and tour operators see their own roles in eco-tourism in Antarctica, and also studies whether tourists gain knowledge about Antarctic wildlife and the functional aspects of this pristine environment. The main aim of this paper is to analyse stakeholder (tourist and tour operator) perceptions to investigate if the assertion that tourists can become ambassadors for the protection of the Antarctic continent after visiting is evident, and if not, how we should avoid more impacts created by greater demand.

The paper explores how these two contrasting views, 'last chance tourism' and 'ambassadorship', evolve in practice and suggests greater responsibility by all tourism stakeholders in maintaining the integrity of the ecosystem while delivering social and economic value, and also providing knowledge about the wildlife and its conservation needs. These aspects are crucial in the case of eco-tourism when visiting fragile, pristine, and relatively undisturbed natural areas, and when intended as a low-impact and often small-scale alternative to mass tourism. The purpose of ecotourism may include educating the traveller and providing funds for ecological conservation (Honey, 2008).

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The paper distinguishes between the roles of tourists and tour operators in views about the future of Antarctica. Are tourists aware of this future? Are tourists sufficiently informed about the structure and functioning of this continent? Can tour operators be considered protectors of the continent or just users? Should education be part of their mission and role?

We carried out in-depth interviews of stakeholders and in situ interviews of tourists visiting Antarctica, in order to explore their perceptions from an interdisciplinary perspective based on management and biology. Our findings reveal that the spontaneous trust characterizing ambassadorship is far removed from the perception of tour operators. While a trip to Antarctica modifies the opinions of tourists, such changes in perspective are not always favourable to ecological practices. The ambassadorship role played by tourist visiting Antarctica is unclear.

This paper is structured as follows: (i) a short review of the most relevant literature on Antarctic tourism frames the research focus; (ii) the objectives and methodology used in the fieldwork are discussed; (iii) results of interviews and questionnaires are presented; and (iv) reflections and conclusions are offered together with suggested future lines of research.

2. Antarctic tourism research

Antarctic tourism has generated a significant volume of research. There are several compilations of studies defining polar tourism, its nature, and effects (Hall, 2010; Lamers et al., 2012). We highlight two large research fields, the first covering the management and regulation of Antarctic tourism, and the second dealing with tourist attitudes.

One of the points this research focuses on is the impact of continuous growth as it may weaken tourism management (Haase et al., 2009). A major factor limiting the scope for regulating tourism is the fact that no nation exercises sovereignty over the continent. The IAATO (IAATO, 2014) is a well-established institution "dedicated to facilitating appropriate, safe, and environmentally sound private-sector travel to the Antarctic". Its approach is based on self-regulation. Its stated aims are "to focus activities in support of its mission statement to ensure effective day-to-day management of member activities in Antarctica; educational outreach, including scientific collaboration; and the development and promotion of Antarctic tourism industry best practices. In addition, the IAATO strives to turn returning visitors into 'ambassadors' for Antarctica, serving as champions for conservation efforts to protect The White Continent". Thus, management is actually self regulation and there is growing doubt about its effectiveness. A growing band of critics see Antarctic tourism as an environmental plague. Management of Antarctica is based on self-organisation, driven by the clear collective interest of users in maintaining the quality of the key attractions. Although IAATO is acknowledged as a key player for in situ management (Beck, 1994), self-imposed codes of conduct are maintained by peer pressure (Liggett et al., 2010), and by detailed pre-landing briefings for tourists (Vidas, 1996; Buck, 1998; Joyner, 1998; Mason and Legg, 1999; Liggett et al., 2011; Lamers et al., 2012).

To what extent can one rely on self-regulation? Some authors believe that it is hard to maintain, especially given the fact that joint management of the continent by various nation states does not enable an agreement to be reached on specific management issues bearing on Antarctic tourism. There are also potential conflicts of interest among tour operators regarding 'ambassadorship' (Hall, 1994; Bastmeijer and Lamers, 2012). Stonehouse et al. (1995) argue that the appearance of larger and more cost-effective vessels may encourage tour operators to exploit the business as much as possible and abandon 'the expedition spirit' seen to date. Growth in tourism continues, spurred on by demand and the fact that technology has made trips safer especially for 'soft adventures' using super yachts that carry helicopters, scuba diving equipment, and so on. The result is a growth in yacht-based tourism without proper management controls. The solution is to manage tourism in close collaboration with all stakeholders, assuming that the tour industry and

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tourists will play a more important role than public sector institutions (Swarbrooke, 1999; Bauer, 2010). A tourism action plan needs to be discussed and accepted by all stakeholders, although such an agreement would create difficulties due to differing interests and because it would cause profits to fall in the short-term.

Many authors are demanding a greater presence of outside observers to verify compliance with protocols and are pressing for more research. However, it is necessary to avoid simply repeating the type of studies on topics such as pollution and parks that already fill environmental journals. Rather, the aim must be to create knowledge on the areas hosting 'last chance tourism' and its consequences with a view to drawing lessons for management (Cohen, 1978; May, 1991; Buckley, 1996; Lemelin et al., 2010; Buckley, 2011; Liggett et al., 2011). For instance, Bastmeijer (2009) argues that the rapid growth of tourism in Antarctica raises issues such as: tourist safety; the interaction between science and tourism; and the direct, indirect, and cumulative effects on Antarctica's environment and wilderness. Buckley (2012) considers that research on the measurement and management of all types of tourism impacts should be prioritised.

In addition, perceptual aspects have a bearing on the research advocated. Research carried out over the last 30 years has placed little emphasis on tourist perceptions or their psychological and emotional reasons for visiting (Cessford and Dingwall, 1996; Bauer, 2001). In general, studies are limited to quantitative analyses of tourist demographic traits and the types of journeys they make (Maher et al., 2003). There are constant references to the need to expand research on the social impact of tourism (Davis, 1999; Mason and Legg, 1999; Bauer, 2001) and these calls propose that the nature of tourist experiences be examined as a way of heightening the focus on tourist values and measuring whether tourist support for environmental protection is effective or not.

Some studies, such as those by Eijgelaar et al. (2010), do not show that holidays enhance environmental knowledge or change tourist attitudes. Other studies, such as those by de Bastmeijer and Lamers (2012) and Dunlap and Van Liere (1978) recommend further research on human-nature relationships in Antarctic tourism. More knowledge and awareness of differences in human nature attitudes might encourage stakeholders to seek management solutions based on a greater mutual understanding. One should highlight the use of the New Ecological Paradigm Scale (NEPS) (Dunlap et al., 2000) as a measurement tool, which was subsequently revised by its authors. The new scale consists of 15 items that proved effective in previous studies and adequately cover current environmental concerns. Maher et al. (2003) show how the concept of 'ambassadorship' appears in the literature, as well as in studies by many Antarctic writers and tour operators (Thomas, 1994). Tour operators make a link between visiting the continent and the subsequent role of 'ambassadorship'. They suggest that tourism creates 'ambassadors' by raising awareness through sharing their experiences of the unique natural history of Antarctica and Sub-Antarctica. Maher et al. (2003) argue that there is insufficient empirical research on actions linked to ambassadorship, even though the IAATO focuses on educating visitors so they can press for protection of the Antarctic (Spletstoeser et al., 2004; Roura, 2012). These authors propose research on understanding the 'ambassadorship' concept as a cycle spanning the anticipation of the holiday, onsite experience and behaviour, and the benefits realised through recollection. This research would include stakeholder answers to questions while they were in Antarctica, observations on behaviour, and their 'world view' after the trip. These authors argue that without a scientific study of tourist visits, it is impossible to speak of benefits. Unfortunately, very little rigorous research has been undertaken to answer these questions. Our aim with this work is to acquire a better understanding of tourist and tour operator opinions regarding their roles and the consequences of Antarctic tourism.

3. Analytical framework, methodology, and data collection

3.1. Analytical framework

This study addressed the lack of empirical results on the Antarctic tourist experience by assuming an interdisciplinary perspective combining biology and management, a combination that should enrich discussions and further a greater understanding of Antarctic tourism. The research questions were:

- How do Antarctic tourism stakeholders perceive and present the concept of ambassadorship? Our interest lies in evaluating the validity of the concept from the standpoint of those taking part in Antarctic tourism. These interviews captured perceptions and beliefs for the present and future as part of an analysis of the 'ambassadorship' concept and its likely development.
- Is a pro-ecological orientation by tourists affected by their visit to Antarctica?
- Do tourists gain a greater knowledge of the wildlife and functional aspects of the Antarctic continent during their visit?

The aim of these two last questions is to explore how a visit to Antarctica relates to the 'ambassadorship' concept. Our intention is to ascertain whether the trip affected the ecological orientation of tourists that would foster ambassadorship. The answer to the research questions will contribute to the goal of this paper that is to analyse if and how ambassadorship evolves from the last chance tourism.

This study on both tourist and stakeholder perceptions and opinions provides a multiple perspective analysis and a broad understanding of the situation - an approach already made by [Muller \(1991\)](#).

For the first research question, we focused on the model proposed by [Bauer \(2010\)](#) and based on collaboration between all those concerned to design the fieldwork. [Liggett et al. \(2011\)](#) followed a similar line in evaluating the present and future of Antarctic tourism from the standpoint of stakeholders, based on experience over the last five decades. He used interviews based on 'snowball sampling' to capture stakeholder perceptions and beliefs on future development.

For the second research question on tourists, we took several studies into consideration. Firstly, we considered the 'Five Phases of Visitor Experience' theory put forward by [Clawson and Knetsch \(1966\)](#) and its simplified version for Antarctic trips ([Bauer, 2001](#)). We also studied the work of various authors including: [Maher et al. \(2003\)](#) (who conducted a pilot study on board a cruise ship to examine passenger views on risks and environmental change); [Powell et al. \(2011\)](#) (who used on-site post experience surveys to study trip satisfaction); and [Roura \(2012\)](#) (who used information gleaned from tourist blogs).

We also considered the new ecological paradigm scale (NEPS) ([Dunlap et al., 2000](#)), which measures the results of experience against a baseline. NEPS seeks to measure pro-ecological orientation and comprises 15 items ([Table 1](#)). The internal consistency of the 15 items, which is necessary if they are to be treated as a single construct, was tested in previous research ([Maher et al., 2003](#)) and yielded high correlations between all items and a high alpha coefficient

due to the fact that there was a predominant principle explaining a large part of the total variance. The authors recommend treating the items as a construct and as a single measure of a system with consistent beliefs - rather than the four or five dimensions proposed by some others. That said, the authors acknowledge that there may be occasions where the population characteristics make a multi-dimensional interpretation of the scale more appropriate.

Finally, for the third research question for tourists, we evaluated whether individual understanding of Antarctic marine wildlife and its importance in global ecosystems had increased during the trip. As [Smith \(1975\)](#) noted, the social research paradigm gives less

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validity to propositions confirmed by a single method. This is because a single method may give rise to methodological bias in the data or research approach (Oppermann, 2000). The more varied the methodologies, data, and researchers employed in the analysis of a given problem, the more reliable the final results. We chose (a) in depth interviews; and (b) questionnaires (as recommended by Easterby-Smith and Lowe, 1991) to answer the research questions.

3.2. Methodology and data collection

3.2.1. Semi-structured in-depth interviews with stakeholders

We carried out qualitative research with semi-structured in-depth interviews to study how stakeholders: (1) generate trips to the Antarctic; (2) perceive and present 'ambassadorship'. Antarctic tourism stakeholders were classified according to their main activities or interests, using the categories commonly used for this purpose (Grenier, 2007; Liggett et al., 2011) and eliminating other potential categories (such as residents or incoming guests) as irrelevant to the objective of this phase of the research. The first group comprised 'monitors' and the representatives of organisations that observe and work in the field of Antarctic tourism. The second group comprised of Antarctic tour organisers. In compliance with ethical guidelines and to ensure data confidentiality, the identity of interviewees was protected and a coding system was employed based on Haase et al. (2009). After initial identification of the main stakeholders, we selected the sample using exponential non discriminative snowball sampling (Patton, 2005) in order to gather rich and authentic data (while controlling sampling bias and potential lack of control by using the criteria described in this section).

The interviews were carried out between September and November 2012, initially with two interviewers to verify the interpretations made and one experienced interviewer. The interviews were designed following the criteria defined by Patton (2005) to elicit the opinions and descriptions of respondents regarding the:

- Current situation regarding Antarctic tourism;
- Existing system regulating Antarctic tourism;
- Main benefits and drawbacks for the Antarctic as a tourism destination;
- Largest potential improvement to tourism management;
- 'Ambassador' effect generated by Antarctic tourists;
- Furthering awareness of more environmentally-sustainable tourism in the Antarctic.

The interviews were recorded with the respondents' consent. The process followed the simultaneous fieldwork and analysis approach recommended by Glaser and Strauss (1967) with interviews being transcribed for analysis prior to the following interviews. The analytical method followed was that suggested by Pidgeon and Henwood (2004), Haase et al. (2009) and Liggett et al. (2011), adopting a non-dogmatic constructivist approach employing iterations and induction based upon grounded theory. The transcriptions were then split into well-defined categories as shown in Table 2. Subsequent analysis of these categories was made and linked to the data so as to furnish deeper profiling of the observed phenomena (Charmaz, 2002). The process was followed until saturation point (when no further information is elicited) in 18 interviews (Gummesson, 1999).

3.2.2. Tourist questionnaires

Quantitative research was the second methodology used and was based on tourist questionnaires to ascertain if the trip affected pro-ecological orientations. The quantitative research sought to: (1) conceptualise respondent opinions on their impact on Antarctica; and (2) observe if pro-ecological orientations by respondents changed after visiting Antarctica.

We used questionnaires administered to Antarctic tourists on both their outbound and return voyages, and used Dunlap's questions plus others we drew up ourselves to validate the NEPS results. The interviews were carried out in situ, following [Fridgen \(1984\)](#). In our case, given that this was an initial test, we decided to hold the interviews in just two stages (on the outbound voyage and on the return voyage) given that data-gathering is a critical element in such studies. It also maximised the likelihood of obtaining responses.

The questionnaires were given to tourists on both the outward and return legs of the voyage. In December 2011, we handed out questionnaires in English and Spanish to passengers on the M/V Plancius bound for the Antarctic Peninsula and the South & Mid-Atlantic Islands. We also administered questionnaires to tourists landing at the Spanish base of Gabriel de Castilla at Deception Island (South Shetland Islands, Antarctica). In January 2012, we repeated the exercise on the return voyage. In December 2012, in Ushuaia (Argentina), we gathered in the trip questionnaires to ensure we had as much data as possible. We obtained 22 responses during the outbound voyage and 33 for the return voyage.

The questionnaire contained 25 statements, some of which contained sub-sections, bringing the total to 36 statements and two final questions. Respondents were asked to state the extent to which they agreed or disagreed with each statement on a 5-point scale (ranging from 'strongly agree' to 'strongly disagree'). The questionnaire heading stated: "Listed below are statements about the relationship between humans and the environment. For each one, please indicate whether you: strongly agree (SA); mildly agree (MA); are unsure (U); mildly disagree (MD); strongly disagree (SD)". We used the 5-Point Likert scale, with 5 corresponding to "strongly agree" and 1 to "strongly disagree". The items were worded so that agreement in even-numbered questions indicated a pro-ecological view and the converse with odd-numbered questions.

The questionnaires contained two parts. The first part comprised 15 statements, using NEPS ([Dunlap et al., 2000](#)), which enabled us to compare results with earlier studies using the same tool, such as those by [Maher et al. \(2003\)](#).

The second part of the questionnaire sought to validate the answers obtained in the first part (the NEPS items) and also analysed if tourists were more knowledgeable about the Antarctic after visiting. Questions covered activities most likely to harm or threaten the Antarctic environment; the need for information on Antarctica; and possible measures for protecting Antarctica. Two final questions covered knowledge of Antarctic marine organisms and their functions in the ecosystem. We introduced these final questions dealing with the biology of the Antarctic continent to assess if tourist's knowledge increased after visiting the place, as a better understanding of functional aspects of the Antarctic ecosystem could influence tourist perception and the issue of advocacy.

4. Results

4.1. Semi-structured in-depth interviews of stakeholders

Analysis of the qualitative data obtained from the in-depth interviews enabled us to answer our first research question. Our mixed team comprising management and biology researchers was innovative and facilitated access to stakeholders, as well as furnishing invaluable feedback on their arguments.

We found a split in opinions on the extent to which Antarctic tourism generated tourist 'ambassadors'. Observers considered the most worrying trends to be the rise in the number of

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Antarctic tourists and tour operators, the type of vessels, and the need to cut costs to maintain demand. Tour operators acknowledged that rising numbers of expeditions, the type of ships used, and the lack of expert staff meant that greater efforts were needed in self-regulation. It was frequently commented that smaller vessels are increasingly used to escape regulations, while larger vessels may seriously damage the ecosystem when they disembark 500 passengers at a time. Hence, tour operators expressed doubts regarding the future development of self regulation. The impact of tourism on Antarctica generated similar views. The most notable point was that a personal experience of Antarctica was needed to produce the social commitment to protect the continent. For example:

- M2. "I do not believe the Antarctic benefits from tourism in the slightest. At most, one can consider it the lesser evil. That is because if there was no tourism, some even more destructive economic activity would take its place. At the educational level, making society aware of the Antarctic's importance is paramount. People only protect what they know."
- O4. "Our self-regulatory approach has two aims: making tourism sustainable and fostering conservation of the Antarctic through support, education, and dissemination activities."

The 'ambassadorship' concept appears in connection with possible improvements to Antarctic management; however, it is only mentioned by tour operators. Monitors focus on improving controls, cutting tourist and vessel numbers, limiting beach access to reduce stress on warm-blooded animals, more sea and land nature reserves, and stricter controls on waste. For operators, the greatest improvement would be more training and information, better-controlled contact with nature to improve environmental awareness, and more scientific videos. The analysis reveals that the 'ambassadorship' concept is little-mentioned by monitors - but frequently mentioned by tour operators.

Analysis of the 'ambassadorship' concept is even more revealing. The 'fostering awareness' concept is desired but not shared. Scientists are considered the only valid 'ambassadors' for the continent - and tour operators showed little interest in altering tourist opinions and perceptions. For example:

- M6. "Tourists are not particularly concerned. It might be a positive factor but if it only boosted demand, then it could be counter-productive. This has changed in the last five years when the wealthy came to see the landscape. Now, there are charters and tourists want to swim and dive."
- O5. Tourists could make their communities more aware - but scientists should be the real 'ambassadors'. We do not expect tourists or ship-owners to do anything for free.

The final section of the exploratory analysis led to the formulation of hypotheses on the measures required for tourists to become more environmentally aware. The key role seems to be played by expedition leaders who accompany the tourists. Their job includes explaining the rules to tourists - and this is especially important for those leaders working on smaller vessels given that have fewer resources. Leaders must also take photos of footprints and litter to encourage environmental awareness.

- M2. "Many rules are being applied but nobody knows whether they work or not. Tourists pay attention but goodness knows whether it does any good. Tourists take photos and write their blogs but who knows whether it has changed their thinking. Today's tourists are a very different bunch from those a few years back."

In summary, stakeholder perceptions and opinions vary widely. There is little spontaneous confidence in the 'ambassadorship' effect; and only when the measures that should be taken are discussed is there some similarity to the debate as to how and why tourists should be turned into 'ambassadors'.

4.2. Tourist questionnaires

4.2.1. Changes in the ecological orientation of tourists after visiting Antarctica

Using the collected data, we made a descriptive analysis of the variables. An acceptable Cronbach value (Tables 3 and 4) showed that the total correlations among the items ensured the scale's internal consistency. On analysing the main components, we confirmed that the main component explained 31% of the variance, while the second component explained 14%. Therefore, following Dunlap's suggestion, it makes sense to consider the 15 items as a single construct for measuring pro-ecological orientation.

Frequencies (in percentages) for each variable are shown in Table 5. In general, there is a tendency towards pro-ecological beliefs. This is especially true with regard to a vision that does not treat man as an exception (item 9), that is not anthropologically centered (item 7), and considers the fragility of nature (items 8 and 13). One should also note the percentage of indifferent/unsure responses (item 1 about limits, and items 4 and 14 about antianthropocentrism).

Subsequently, we looked at whether there were any significant variations between the results obtained on the outbound voyage and those on the return voyage. For this purpose, we took the 'SA' (strongly agree) & 'A' (agree) (responses where agreement indicates a pro-ecological view), and the 'SD' (strongly disagree) and 'D' (disagree) responses (where disagreement indicates a proecological worldview) (Table 6). Taking the 85% confidence level ($s < 0.125$) in Kendall's Tau-b test, we noted that four variables showing significant variations: 2 (humans have the right to modify the natural environment; 6 (the Earth has plenty of natural resources and we just learn how to develop them; 7 (plants and animals have as much right as humans to exist; 11 (the Earth is like a spaceship with very limited room and resources. Surprisingly, attitudes for two items showed a tendency towards less pro-ecological beliefs (items 7 and 11).

In general, although the variations were not statistically significant, results show greater pro-ecological orientation on the return trip with regard to: anti-anthropocentrism (item 2); rejection of 'exceptionalism' (items 4, 9 and 14); possibility of an eco-crisis (items 5 and 15); and the reality of limits to growth (item 6). At the same time, there were some items for which tourist opinions on the return voyage were less pro-ecological - especially in the case of natural balance (although the variation was small).

We can conclude that the ecological orientations of tourist were modified after visiting Antarctica - but that these modifications were not always in a pro-ecological direction.

4.2.2. Tourists perceptions about the situation of Antarctica

The results of the second section of the questionnaire, ordered from greatest agreement to least (Table 7), indicate that the two variables commanding the greatest overall agreement were:

- The need to renew the international treaty to protect the Antarctic (93% agreement);
- Greater environmental awareness of Antarctica after the visit (82% agreement).

Over half of respondents said they were familiar with the destination; however, many wanted more information on the international treaty (57%), the Antarctic environment (53%), and activities harming the continent (54%). With regard to the activities considered environmentally harmful, fishing was seen as the worst, coming far ahead of shipping, tourism, and research activities. It seems many respondents had doubts about the future of the Antarctic environment (30% agreed). There was general agreement that man (71%) and climate change (62%) are the gravest threats to the environment. The two measures to reduce environmental risks that commanded greatest support were increasing public resources from countries with Antarctic bases and imposing conservation taxes (54%).

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In comparing responses for the outward bound and return voyages, we took an 85% confidence level ($s < 0.125$) in Kendall's Tau-b test and observed four variables showing significant variation and three concerning the demand for more information (negative delta) and the variable covering greater environmental awareness of Antarctica (positive delta).

The variations observed indicated that 11 of the 21 items showed increases in the frequency of agreement (Table 8). The degree of agreement rose for the following variables on the return trip:

- Awareness of the Antarctic environment.
- Man and climate change as future threats.
- Shipping as an environmentally harmful activity.
- The need to renew the international treaty and introduce a tax for Antarctic conservation.

While other variables commanded less agreement, especially those concerning:

- The need for more information.
- The future of the Antarctic environment.

We can also conclude that changes in pro-ecological orientation by tourists are shown in the second part of the questionnaire. On the return trip, one of their main concerns was the need to renew the Antarctic Treaty as a way of protecting the Antarctic. Respondents said they had become more aware of the need for environmental protection and stated that the main threat is man.

4.2.3. Tourist knowledge of marine biology

The final part of the questionnaire analysed knowledge about Antarctic marine biology at a very basic level. We introduced two questions to measure tourist knowledge about the: (i) principal animal groups that inhabit Antarctic waters; and (ii) if they know which animals regulate Antarctic food chains. There were significant differences in the answers on the outbound and return trips (Tables 9 and 10). The 'no-answer' rate fell from 48% to 28%. It would seem that the respondents were more knowledgeable and confident - but this is not reflected in the data. Of the 11 animal groups presented in Question 26, tourists only became more knowledgeable about two groups; while they seemingly became less knowledgeable about the other nine animal groups. Furthermore, 70% of tourists did not know more than one of the listed animal groups; and only 6.4% knew more than three.

We assessed whether Antarctic tourists only had knowledge regarding large Antarctic animals (whales, seals, and penguins) and whether their knowledge reflected the importance of Antarctic invertebrates. We wanted to see the differences in knowledge between high-top level predators, such as whales and starfish, as representatives of their groups (vertebrate vs. invertebrate or large vs. small animals). We found that only 5.3% of tourist marked starfish as predators, while 81.6% marked whales as 'Antarctic predators'.

5. Discussion and conclusions

Human influence on the Earth's land surface is a global driver of ecological processes (CIESIN, 2002). Most of the Earth's land surface has been influenced directly by human beings and few regions remain largely virgin (Barnosky et al., 2012). Antarctica is one of these world's last wildernesses and offers new opportunities for nature-based tourism, and our surveys confirmed that there is an increased awareness about the Antarctica environment among returning tourists. This is in line with Arcury and Christianson (1990), who concluded that "critical environmental experiences can accelerate change in an environmental worldview".

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The survey findings reveal a general tendency for pro-ecological views in the same way that previous studies found "a tendency for respondents to endorse pro-ecological beliefs". This is especially true for seeing the balance of nature as being threatened by human activities - but is much less true for accepting the idea that there are limits to growth. There is also considerable variation in the proportions 'unsure' about the various statements / with over 20% unsure about items 1 (on limits) and 4 and 14 (both on human exceptionalism).

The survey did not show that tourists to Antarctica learned about the functional aspects of such a pristine environment other than acquiring some knowledge about the large resident animals.

Tour operators in Antarctica seem to fail making the connection between ecosystem health and corporate performance and the future risks to their own activities arising from possible degradation of the ecosystem and the role it plays. Enlightening tourists during their visit about the structure and functioning of the continent could help with regards to a better understanding of individual tourist perceptions and the issue of advocacy. As recently pointed out ([Hanson et al., 2012](#)), ecosystem degradation is highly relevant to business because tour operators and the services they provide also depend on these ecosystems.

IAATO claims to educate tourists so they can advocate protection of the continent ([Spletstoesser et al., 2004](#); [Roura, 2012](#)). However neither the role envisaged by IAATO for companies in educating their customers, nor the way it sees the Antarctic environment working seems wide enough in scope to give substance to this concept of 'ambassadorship'. Some stakeholders even argue that this is not its mission and point out the strategic role played by corporate social responsibility in today's business world. The responses obtained in our questionnaire showed a greater environmental awareness and hopes for renewal of the Antarctic Treaty among tourists on the return trip. Even so, tourists seem to learn very little about the Antarctic's remarkable wildlife. The concept of 'ambassadorship' roles being seeded in tourists seems to be largely a reflection of the environmental steps that managers and monitors believe should be taken.

Although IAATO and other stakeholders call for 'self-regulation' to control Antarctica as a tourist destination, others stressed the need for better and more integrated tourism management for operations both large and small ([Bauer, 2010](#)). Issues raised in the interviews (such as companies escaping control, or the appearance of new niche segments) seem to threaten the industry's commitment to Antarctic protection. Bearing this in mind, an overarching regulatory structure could help to prevent Antarctica turning into a mass tourist destination, as might a management approach that adheres to responsible tourism principles and implements sustainable practices.

Tourists returning from the Antarctic do not seem to play the role of ambassadors because many visitors merely want a last chance to glimpse a vanishing world. These tourists are generally in favour of a renewal of the Antarctic Treaty. If the idea is to visit Antarctica as the last of the world's truly wild places, tourists should do their utmost to protect it and oblige tour operators to take proper precautions. Accordingly, a combination of new agreements for the protection of Antarctica, better planning, use of management tools, and enhanced education of visitors might further enhance conservation. Tourism activities in the Antarctic continent should include an educational element that will lead to a transformation and long-term commitment by tourists to promote visited regions and support Antarctic conservation.

Some opportunities for further research were suggested by our awareness of the limitations of our study, which were largely the result of the small number of responses, but also from the fact that we worked with opinions that may have little impact on decision making when compared with the economic power of stakeholders. The nature of the study only enables us to observe if there is an increase in environmental awareness (or ambassadorship effect) among tourists. The qualitative study shows two competing hypotheses about whether Antarctic tourism generates an ambassador effect or is 'last chance tourism'; and the quantitative study shows that the pro-ecological orientation effect is only partial and only apparent in some dimensions.

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Future research may find data for temporal studies following the study carried out by Dunlap, in which he compared data between 1976 and 1990 and concluded that there seemed to be evidence that pro-ecological views were gaining support. As the need for careful planning in the spread of tourist activities is an important topic appearing in our study, future research could focus on: carrying capacity; the development of a consolidated regulation system with standards; the need for a single regulatory body; or the features required for a responsible Antarctic tourism action plan to be developed by IAATO.

Our exploratory work advances the discussion and understanding of tourist and tour operator perceptions on the paradox posed by 'last chance tourism' and 'ambassadorship' and enhances previous research by combining methodologies and taking an interdisciplinary perspective based on biology and management. Some benefits of a multidisciplinary research like this is to approach the phenomenon of tourism in the Antarctica under different angles, seeking to overcome existing interdisciplinary contradictory explanations; to have a greater ability to understand the points of view of people surveyed; to have greater access and experience to access the research subjects, and to design research tools; to generate a greater number of potential future developments, both in research and in terms of management; the use of the language used (in interaction with tourists, businessmen or biologists) more shared, which reduced misunderstandings and possible confusion. If the main aim of tourists is to enjoy a 'last chance' to visit Antarctica as one of the last wildernesses on Earth (Smith, 2008), we advocate a more focused educational commitment by Antarctic tour companies in developing future 'ambassadors'.

References

- Arcury, T.A., Christianson, E.H., 1990. Environmental worldview in response to environmental problems. Kentucky 1984 and 1988 compared. *Environ. Behav.* 22, 387-407.
- ATCM, 2012. Antarctic tourism consultative meeting, resolution 7, vessel safety in the Antarctic treaty area, 259. In: Final Report of the Thirty-fifth Antarctic Treaty Meeting, vol. I. Hobart, Australia.
- Barnosky, A., Hadly, E., Bascompte, J., Berlow, E., Brown, J., Fortelius, M., Getz, W., Harte, J., Hastings, A., Marquet, P., Martinez, N., Mooers, A., Roopnarine, G., Vermeij, P., Williams, J., Gillespie, R., Kitzes, J., Marshall, Ch, Matzke, N., Mindell, D., Revilla, E., Smith, A., 2012. Approaching a state shift in Earth's Biosphere. *Nature* 486, 52-58.
- Bastmeijer, K., 2009. A long term strategy for Antarctic tourism: the key to decision making within the Antarctic treaty system? In: Maher, Patrick, Stewart, Emma, Lück, Michael (Eds.), *Polar Tourism: Human, Environmental, and Governance*. Cognizant Communication Corporation, Elmsford, NY.
- Bastmeijer, K., Lamers, M., 2012. Reaching consensus on Antarctic tourism regulation: calibrating the human-nature relationship?. In: *New Issues in Polar Tourism*. Springer Verlag, Heidelberg.
- Bauer, T.G., 2010. Sustainable tourism management-learning from Antarctica. In: *CAUTHE 2010: Tourism and Hospitality: Challenge the Limits*, p. 105.
- Bauer, T.G., 2001. *Tourism in the Antarctic: Opportunities, Constraints, and Future Prospects*. Haworth Hospitality Press.
- Beck, P.J., 1994. Managing Antarctic tourism: a front-burner issue. *Ann. Tour. Res.* 21, 375-386.
- Buck, S.J., 1998. *The Global Commons: an Introduction*. Island Pr.
- Buckley, R., 2012. Sustainable tourism: research and reality. *Ann. Tour. Res.* 39, 528-546.
- Buckley, R., 2011. Tourism and environment. *Ann. Rev. Env. Res.* 36, 397-416.
- Buckley, R., 1996. Sustainable tourism: technical issues and information needs, 23, 925-928.
- Cessford, G.R., Dingwall, P.R., 1996. *Tourist Visitors and Their Experiences at New Zealand Subantarctic Islands*. Department of Conservation Wellington, New Zealand.
- Charmaz, K., 2002. Stories and silences: disclosures and self in chronic illness. *Qual. Inq.* 8, 302-328.
- CIESIN, 2002. Last of the Wild Project, Version I (LWP-1): Global Human Footprint. Dataset (Geographic). Wildlife Conservation Society (WCS) and Center for International Information Network (CIESIN). NASA Socioeconomic Data and Applications Center (SEDAC), Palisades, NY. Available at: <http://sedac.ciesin.columbia.edu/data/set/wildareas-v1-last-of-the-wild-ighp/> [2014, May].
- Clawson, M., Knetsch, J.L., 1966. *Economics of Outdoor Recreation*. John Hopkins Press, Baltimore.

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- Cohen, E., 1978. The impact of tourism on the physical environment. *Ann. Tour. Res.* 5, 215-237.
- Davis, P.B., 1999. Beyond guidelines: a model for Antarctic tourism. *Ann. Tour. Res.* 26, 516-533.
- Dunlap, R.E., Van Liere, K.D., 1978. A proposed measuring instrument and preliminary results: the 'New Environmental Paradigm'. *J. Env. Ed.* 9, 10-19.
- Dunlap, R.E., Van Liere, K.D., Mertig, A.G., Jones, R.E., 2000. New trends in measuring environmental attitudes: measuring endorsement of the new ecological paradigm: a revised NEP scale. *J. Soc.* 56, 425-442.
- Easterby-Smith, M.T.R., Lowe, A., 1991. *Management Research: an Introduction*.
- Eijgelaar, E., Thaper, C., Peeters, P., 2010. Antarctic cruise tourism: the paradoxes of ambassadorship, 'last chance tourism' and greenhouse gas emissions. *J. Sust. Tour.* 18, 337-354.
- Fridgen, J.D., 1984. Environmental psychology and tourism. *Ann. Tour. Res.* 11, 9-39.
- Glaser, B.G., Strauss, A.L., 1967. *The Discovery of Grounded Theory: Strategies for Qualitative Research*. Aldine Publishing Company.
- Grenier, A.A., 2007. The diversity of polar tourism. Some challenges facing the industry in Rovaniemi, Finland. *Pol. Geog.* 30, 55-72.
- Gummesson, E., 1999. *Qualitative Methods in Management Research*. SAGE Publications, Incorporated.
- Haase, D., Lamers, M., Amelung, B., 2009. Heading into uncharted territory? Exploring the institutional robustness of self-regulation in the Antarctic tourism sector. *J. Sust. Tour.* 17, 411-430.
- Hall, C.M., 1994. *Tourism and Politics: Policy, Power and Place*. John Wiley and Sons Ltd.
- Hall, C.M., 2010. Tourism and environmental change in polar regions: impacts, climate change and biological invasion. In: Hall, C.M., Jarkko, S. (Eds.), *Tourism and Change in Polar Regions: Climate, Environments and Experiences*. Routledge, NY, pp. 42-70.
- Hall, C.M., Saarinen, J., 2010. Tourism and change in polar regions: climate, environments and experiences. In: Hall, C.M., Jarkko, S. (Eds.), *Tourism and Change in Polar Regions: Climate, Environments and Experiences*. Routledge, NY, pp. 1-41.
- Hanson, C., Ranganathan, J., Iceland, C., Finisdore, J., 2012. *The Corporate Ecosystem Service Review: Guidelines for Identifying Business Risks and Opportunities Arising from Ecosystem Change. Version 2.0*. World Resource Institute, Washington, D.C.
- Headland, R.K., 1994. Historical development of Antarctic tourism. *Ann. Tour. Res.* 21, 269-280.
- Honey, M., 2008. *Ecotourism and Sustainable Development: Who Owns Paradise?*, second ed. Island Press, Washington, DC., p. 33
- IAATO, 2014. What is IAATO. Available: <http://iaato.org/es/what-is-iaato> [2014, Sept].
- Joyner, C.C., 1998. *Governing the Frozen Commons: the Antarctic Regime an Environmental Protection*. University of South Carolina Press, Columbia, SC (USA).
- Lamers, M., Amelung, B., 2007. The environmental impacts of tourism in Antarctica: a global perspective. *NHTV Academic Studies* 6. In: Peeters, P. (Ed.), *Tourism and Climate Change Mitigation: Methods, Greenhouse Gas Reductions and Policies*. Stichting, HTV Breda, The Netherlands, pp. 31-63.
- Lamers, M., Liggett, D., Amelung, B., 2012. Perspective: strategic challenges of tourism development and governance in Antarctica: taking stock and moving forward. *Pol. Res.* 31, 17-19.
- Lemelin, H., Dawson, J., Stewart, E.J., Maher, P., Lueck, M., 2010. Last-chance tourism: the boom, doom, and gloom of visiting vanishing destinations. *Curr. Issues Tour.* 13, 477-493.
- Liggett, D., McIntosh, A., Thompson, A., Storey, B., Gilbert, N., 2010. Stakeholder perspectives on the governance of Antarctic cruise tourism. In: Lück, M., Maher, P., Stewart, E. (Eds.), *Cruise Tourism in Polar Regions: Promoting Environmental and Social Sustainability*. Earthscan, London, pp. 167-203.
- Liggett, D., McIntosh, A., Thompson, A., Gilbert, N., Storey, B., 2011. From frozen continent to tourism hotspot? Five decades of Antarctic tourism development and management, and a glimpse into the future. *Tour. Manag.* 32, 357-366.
- Maher, P.T., Steel, G., McIntosh, A.J., 2003. Antarctica: tourism, wilderness, and 'ambassadorship'. In: Watson, A., Sproull, J. (Eds.), *Science and Stewardship to Project and Sustain Wilderness Values*. Seventh World Wilderness Congress Symposium, p. 2.
- Mason, P., Legg, S., 1999. Antarctic tourism: activities, impacts, management issues, and a proposed research agenda. *Pac. Tour. Rev.* 3, 71-84.

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- May, V., 1991. Tourism, environment and development: Values, sustainability and stewardship. *Tour. Manag.* 12, 112-118.
- Muller, T.E., 1991. Using personal values to define segments in an international tourism market. *Int. Mark. Rev.* 8, 1.
- Oppermann, M., 2000. Triangulation A methodological discussion. *Int. J. Tour. Res.* 2, 141-145.
- Patton, M.Q., 2005. *Qualitative Research*. Wiley Online Library.
- Pidgeon, N., Henwood, K., 2004. Grounded Theory. *Handbook of Data Analysis*, pp. 625-648.
- Powell, R.B., Brownlee, M.T., Kellert, S.R., Ham, S.H., 2011. From awe to satisfaction: immediate affective responses to the Antarctic tourism experience. *Pol. Rec.* 48, 145-156.
- Roura, R.M., 2012. Being there: examining the behaviour of Antarctic tourists through their blogs. *Pol. Res.* 31, 10905.
- Singh, T.V., 2012. *Critical Debates in Tourism*. Channel View Books.
- Smith, H.W., 1975. *Strategies of Social Research: the Methodological Imagination*. Prentice-Hall, Englewood Cliffs, NJ.
- Smith, J., 2008. Endangered Destinations: Places, like Species, Can Vanish Forever. A Look at Some Unique, Imperiled Treasures, pp. 36e43. *US News & World Report*, May 26-June. 2.
- Snyder, J., 2007. *Tourism in the Polar Regions: the Sustainability Challenge*. UNEP/ Earthprint.
- Spletstoesser, J., Landau, D., Headland, R., Singh, T., 2004. Tourism in the forbiddenlands: the Antarctica experience. In: Singh, T. (Ed.), *New Horizons in Tourism. Strange Experiences and Stranger Practices*. CABI Publishing, Cambridge, USA, pp. 27-36.
- Stonehouse, B., Crosbie, K., Hall, C., Johnston, M., 1995. Tourist impacts and management in the Antarctic Peninsula area. In: Hall, C.M., Johnston, M.E. (Eds.), *Polar Tourism: Tourism in the Arctic and Antarctic Regions*. CABI Publishing, Cambridge, USA, pp. 217-233.
- Swarbrooke, J., 1999. *Sustainable Tourism Management*. Cabi.
- Vidas, D., 1996. The antarctic treaty system in the international community: an overview. In: Stokke, Olav Schram, Vidas, Davor (Eds.), pp. 35-60 (Hrsg.).
- Weaver, D.B., 2005. Comprehensive and minimalist dimensions of ecotourism. *Ann. Tour. Res.* 32, 439-455.
- Zeppel, H., Muloin, S., 2008. Education and conservation benefits of interpretation on marine wildlife tours. *Tour. Mar. Environ.* 5, 215-228.

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Table 1
New ecological paradigm Scale's items (Dunlap et al., 2000).

Item description	Item number
Limits of growth	
We are approaching the limit of the number of people the earth can support	1
The earth has plenty of natural resources if we just learn how to develop them	6
The earth is like a spaceship with very limited room and resources	11
Antianthropocentrism	
Humans have the right to modify the natural environment to suit their needs	2
Plants and animals have as much right as humans to exist	7
Humans were meant to rule over the rest of nature	12
Fragility of nature balance	
When humans interfere with nature to often produces disastrous consequences	3
The balance of nature is strong enough to cope with the impacts of modern industrial nations	8
The balance of nature is very delicate and easily upset	13
Rejection of exemptionalism	
Human ingenuity will insure that we do NOT make the earth unlivable	4
Despite our special abilities humans are still subject to the laws of nature	9
Humans will eventually learn enough about how to be able to control it	14
Possible ecocrisis	
Humans are severely abusing the environment	5
The so called "ecological crisis" facing humankind has been greatly exaggerated	10
If things continue on their present course, we will soon experience a major ecological catastrophe	15

Table 2
Categorization and coding of the interviews (based on Haase et al., 2009).

Interviewee	Category	Affiliation	Position	Interviewer & date
M1	Monitor	Research institution	Biology researcher	GC & MV 14/09/2012
M2	Monitor	Environmental NGO	Project coordinator	GC&MV 16/10/2012
M3	Monitor	Research institution	Astronomy researcher	GC 25/09/2012
M4	Monitor	Research institution	Research Center Director	GC 29/11/2012
M5	Monitor	Research institution	Researcher	GC 25/10/2012
M6	Monitor	Research institution	Lecturer & scientist	GC 04/11/2012
M7	Monitor	University	Researcher	GC 05/11/2012
M8	Monitor	Polar research institute	Researcher	GC 05/11/2012
M9	Monitor	University	Lecturer & scientist	GC 06/11/2012
01	Organizer	Ship based with landings (<200 passengers) bachelor communication	Co-Owner and Expedition leader	GC & MV 07/09/2012
02	Organizer	Ship based with landings (<200 passengers) bachelor in biology	Expedition leader	GC 10/09/2012
03	Organizer	Ship based with landings (<200 passengers) MBA business	VP Sales & marketing	GC 10/10/2012
04	Organizer	Ship based with landings (<200 passengers)	Upper-level representative	GC 14/10/2012
05	Organizer	Ship based with landings (<200 passengers) degree in public relations	Sales & marketing	GC 14/10/2012
06	Organizer	Ship based with landings (200-500 passengers) biologist	Lecturer/scientist	GC 05/11/2012
07	Organizer	Ship based with landings (200-500 passengers) tourism	Sales & marketing	GC 05/11/2012
08	Organizer	Ship based with landings (200-500 passengers) Tourism	Sales & marketing	GC 06/11/2012
09	Organizer	Ship based with landings (200-500 passengers) captain	Expedition leader	GC 10/11/2012

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Table 3
Spearman rho correlations of NEPS items.

VARs		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	C.correlation	1.00														
	Sig. (bilateral)	–														
2	C.correlation	–0.01	1.00													
	Sig. (bilateral)	0.96	–													
3	C.correlation	0.31	–0.18	1.00												
	Sig. (bilateral)	0.02	0.19	–												
4	C.correlation	–0.02	0.29	–0.16	1.00											
	Sig. (bilateral)	0.87	0.03	0.24	–											
5	C.correlation	0.48	–0.29	0.55	–0.27	1.00										
	Sig. (bilateral)	0.00	0.03	0.00	0.04	–										
6	C.correlation	–0.01	0.16	0.15	0.28	0.06	1.00									
	Sig. (bilateral)	0.96	0.25	0.27	0.04	0.65	–									
7	C.correlation	0.38	–0.16	0.40	–0.04	0.37	0.11	1.00								
	Sig. (bilateral)	0.00	0.24	0.00	0.77	0.01	0.42	–								
8	C.correlation	–0.35	0.32	–0.31	0.40	–0.44	0.37	–0.27	1.00							
	Sig. (bilateral)	0.01	0.02	0.02	0.00	0.00	0.00	0.05	–							
9	C.correlation	0.22	0.02	0.20	–0.12	0.05	–0.49	0.11	–0.34	1.00						
	Sig. (bilateral)	0.11	0.87	0.14	0.38	0.70	0.00	0.45	0.01	–						
10	C.correlation	–0.26	0.17	–0.15	0.55	–0.37	0.43	–0.17	0.61	–0.39	1.00					
	Sig. (bilateral)	0.06	0.24	0.30	0.00	0.01	0.00	0.24	0.00	0.00	–					
11	C.correlation	0.35	0.14	0.32	–0.05	0.35	–0.06	0.04	–0.26	0.08	–0.38	1.00				
	Sig. (bilateral)	0.01	0.30	0.02	0.73	0.01	0.66	0.80	0.05	0.55	0.00	–				
12	C.correlation	–0.32	0.19	–0.20	0.39	–0.27	0.32	–0.45	0.63	–0.42	0.64	–0.16	1.00			
	Sig. (bilateral)	0.02	0.15	0.15	0.00	0.05	0.02	0.00	0.00	0.00	0.00	0.24	–			
13	C.correlation	0.39	–0.11	0.43	–0.27	0.61	–0.06	0.22	–0.54	0.30	–0.52	0.43	–0.37	1.00		
	Sig. (bilateral)	0.00	0.43	0.00	0.04	0.00	0.65	0.12	0.00	0.03	0.00	0.00	0.00	–		
14	C.correlation	0.21	–0.01	0.04	0.30	0.11	0.18	0.04	0.30	–0.08	0.37	–0.09	0.20	–0.13	1.00	
	Sig. (bilateral)	0.13	0.94	0.74	0.03	0.42	0.19	0.79	0.02	0.57	0.01	0.52	0.15	0.34	–	
15	C.correlation	0.56	–0.25	0.48	–0.40	0.75	–0.09	0.46	–0.60	0.23	–0.54	0.42	–0.53	0.66	–0.12	1.00
	Sig. (bilateral)	0.00	0.06	0.00	0.00	0.00	0.53	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.38	–

Table 4
Cronbach Alfa of NEPS items.

Dimension	Cronbach alfa	Explained Variance	
		Total (self-values)	Inertia
1	.886	5.785	.386
2	.864	5.169	.345
Total		10.955	.730
Media	.876 ^a	5.477	.365

^a The Cronbach Median Alpha is based on average self-values.

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Table 5
Frequency distributions for NEPS Items and Pro-Ecological orientation (%). Total responses.

Item description	Item number	SD ^a	MD	U	A	SA	Pro eco.
Limits of growth							
We are approaching the limit of the number of people the earth can support	1	1.8	19.6	14.3	28.6	35.7	64.3
The earth has plenty of natural resources if we just learn how to develop them	6	8.9	16.1	8.9	39.3	25.0	25.0
The earth is like a spaceship with very limited room and resources	11	8.9	14.3	8.9	41.1	26.8	67.9
Antianthropocentrism							
Humans have the right to modify the natural environment to suit their needs	2	28.6	32.1	8.9	28.6	1.8	60.7
Plants and animals have as much right as humans to exist	7	5.4	5.4	0.0	26.8	58.9	85.7
Humans were meant to rule over the rest of nature	12	46.4	26.8	5.4	10.7	10.7	73.2
Fragility of nature balance							
When humans interfere with nature to often produces disastrous consequences	3	7.1	10.7	5.4	35.7	41.1	76.8
The balance of nature is strong enough to cope with the impacts of modern industrial nations	8	44.6	39.3	3.6	7.1	5.4	83.9
The balance of nature is very delicate and easily upset	13	5.4	7.1	5.4	32.1	50.0	82.1
Rejection of exemptionalism							
Human ingenuity will insure that we do NOT make the earth unlivable	4	21.4	25.0	19.6	21.4	12.5	46.4
Despite our special abilities humans are still subject to the laws of nature	9	1.8	0.0	3.6	25.0	69.6	94.6
Humans will eventually learn enough about how to be able to control it	14	28.6	32.1	21.4	14.3	3.6	60.7
Possible ecocrisis							
Humans are severely abusing the environment	5	5.4	10.7	7.1	26.8	50.0	76.8
The so called "ecological crisis" facing humankind has been greatly exaggerated	10	33.9	28.6	10.7	17.9	3.6	62.5
If things continue on their present course, we will soon experience a major ecological catastrophe	15	7.1	16.1	12.5	33.9	30.4	64.3

^a SA = Strongly Agree, MA = Mildly Agree, U = Unsure, MD = Mildly Disagree, and SD = Strongly Disagree.

Table 6
Pro-ecological orientation. Variations in between outward and homeward voyages.

Item number	Item description	PRO ecological	
		Outward	Homeward
9	Despite our special abilities humans are still subject to the laws of nature	91.3	97
7	Plants and animals have as much right as humans to exist	90.9	87.5
11	The earth is like a spaceship with very limited room and resources	87	54.5
8	The balance of nature is strong enough to cope with the impacts of modern industrial nations	87	81.8
13	The balance of nature is very delicate and easily upset	82.6	81.8
1	We are approaching the limit of the number of people the earth can support	78.3	54.5
12	Humans were meant to rule over the rest of nature	78.3	69.7
3	When humans interfere with nature to often produces disastrous consequences	78.3	75.8
5	Humans are severely abusing the environment	69.6	81.8
10	The so called "ecological crisis" facing humankind has been greatly exaggerated	66.7	65.6
15	If things continue on their present course, we will soon experience a major ecological catastrophe	60.9	66.7
14	Humans will eventually learn enough about how to be able to control it	52.2	66.7
2	Humans have the right to modify the natural environment to suit their needs	52.2	66.7
4	Human ingenuity will insure that we do NOT make the earth unlivable	39.1	51.5
6	The earth has plenty of natural resources if we just learn how to develop them	21.7	28.1

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Table 7
 Agreement (%) to items of the second part of the questionnaire. Total responses.

Item description	Item number	Agreement
The International Antarctic Treaty needs to be renewed in order to protect this habitat for the next 50 years.	18	92.9
After being here, I am more aware of the Antarctic environment	36	82.0
Man is the most important threat for the Antarctic environment	25	70.9
Climate Change is the most important threat for the Antarctic environment	24	61.8
Fisheries are damaging the Antarctic environment	20	57.1
More information on the Antarctic Treaty is needed	27	56.6
More public resources coming from nations with bases in Antarctica are needed	34	53.7
Before to come here, I was familiar with the Antarctic environment	19	53.6
An Antarctic tax for conservation issues is needed	32	53.6
More information on the Antarctic environment is needed	26	52.8
The Antarctic environment is now in very good shape	16	51.8
More information on the damaging activities over the Antarctic environment is needed	28	44.4
More limits on human activities are needed	35	43.6
Maritime transport is damaging the Antarctic environment	21	41.8
Tourism is damaging the Antarctic environment	22	41.8
An Antarctic tax for research purposes is needed	33	41.8
More information on Climate Change is needed	29	33.3
The Antarctic environment, in ten years, will be in very good shape	17	30.4
More land visits and excursions in Antarctica are needed	31	26.4
Research Activities are damaging the Antarctic environment	23	16.4
More parties on board are needed	30	5.5

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Table 8

Agreement (%) to items of the second part of the questionnaire. Variations between outward and homeward voyages.

Item description	Item number	Agreement	
		Outward	Homeward
More information on the Antarctic environment is needed	26	87	26.7
The International Antarctic Treaty needs to be renewed in order to protect this habitat for the next 50 years.	18	82.6	100
More information on the Antarctic Treaty is needed	27	68.2	48.4
More public resources coming from nations with bases in Antarctica are needed	34	60.9	48.4
After being here, I am more aware of the Antarctic environment	36	60	96.7
More limits on human activities are needed	35	52.2	37.5
Man is the most important threat for the Antarctic environment	25	50	84.8
The Antarctic environment is now in very good shape	16	47.8	54.5
Before to come here, I was familiar with the Antarctic environment	19	47.8	57.6
Fisheries are damaging the Antarctic environment	20	47.8	63.6
Climate Change is the most important threat for the Antarctic environment	24	47.8	71.9
More information on the damaging activities over the Antarctic environment is needed	28	47.8	41.9
Tourism is damaging the Antarctic environment	22	43.5	40.6
An Antarctic tax for conservation issues is needed	32	43.5	60.6
More information on Climate Change is needed	29	39.1	29
The Antarctic environment, in ten years, will be in very good shape	17	34.8	27.3
Maritime transport is damaging the Antarctic environment	21	34.8	46.9
An Antarctic tax for research purposes is needed	33	30.4	50
Research Activities are damaging the Antarctic environment	23	17.4	15.6
More parties on board are needed	30	13.6	0
More land visits and excursions in Antarctica are needed	31	13.6	35.5

Table 9

Tourist knowledge about marine animals inhabiting the Antarctic waters expressed as percentages and divided among outward and homeward voyages.

	Animals which live in Antarctic waters			
	Outward		Homeward	
	N	(%)	N	%
Sponges	3	13.64	1	2.70
Corals	2	9.09	2	5.41
Sea urchins	4	18.18	1	2.70
Crabs	5	22.73	8	21.62
Gorgonians	0	0.00	5	13.51
Worms	5	22.73	18	48.65
Anemones	6	27.27	6	16.22
Jellyfish	5	22.73	5	13.51
Sharks	1	4.55	1	2.70
Sea slugs	2	9.09	2	5.41
Sea snails	1	4.55	1	2.70
No answer	11	50.00	14	37.84
Total answers	22		37	

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Table 10
 Tourist knowledge of Antarctic predators expressed as percentages and among outward and homeward voyages.

	Antarctic top predators			
	Outward		Homeward	
	<i>N</i>	(%)	<i>N</i>	(%)
Whales	8	36.36	24	64.86
Sharks	1	4.55	2	5.41
Sea stars	0	0.00	2	5.41
Fishes	1	4.55	1	2.70
Krill	2	9.09	1	2.70
Crabs	1	4.55	0	0.00
Sea worms	0	0.00	0	0.00
Seals	9	40.91	23	62.16
Others	3	13.64	9	24.32
No answer	10	45.45	7	18.92
Total answers	22		37	