ABSTRACT

REAS, JULIANNE LYNN. Exploring Connection to Nature as a Pathway to Local and Global Conservation Actions: Two Exploratory Studies in North Carolina and Antarctica. (Under the direction of Dr. Yu-Fai Leung, and Dr. Kathryn Stevenson).

As climate change effects and biodiversity loss continue to accelerate, the need for local and global mitigation strategies increases. Connecting various populations, both youth and adults, to nature, is a common pathway to promoting pro-conservation ethos and actions. Connection to nature can be fostered through formal and informal educational experiences and is often linked to pro-environmental behaviors. These two studies aim to understand factors influencing connection to nature, and subsequent capacity to act, among two different populations.

The first study compared how different conceptualizations of nature (e.g., “nature” versus “the outdoors”) impacted measurement of connection to nature, particularly among diverse groups of fourth and fifth grade students from two elementary schools in Wake County, North Carolina. Utilizing a quasi-experimental design, we created a “nature” and “the outdoors” version of a survey to test the differences in affective and self-reported connections to nature, between demographic groups of gender and racial/ethnic identities. Analysis utilized non-parametric statistics, Mann Whitney U tests, due to small sample sizes among demographic groups (n=225; 112 “nature,” 113 “outdoors”). Self-reported connection to nature did not vary significantly based on terminology used, but we did find some differences in levels of emotional affinity that students associated with each term. Our results suggest that the differences in which young audiences perceive the terms “nature” versus “outdoors” are nuanced and may offer insight into how language about the environment may invoke different emotions among children. Ensuring language used in programming and measurement is culturally responsive is important in connecting people to the benefits of time spent in nature and increasing conservation behavior. However, increasing the inclusivity of program content may be more impactful in positively shaping students’ conceptualizations and reaching more diverse audiences.

The second study developed and empirically tested a Protected Area Ambassadorship Conceptual Model using polar tour guides as a case study. We first conducted a review of the ambassadorship and tour guiding literature to identify four dimensions of conceptual overlap: place attachment, community, capacity, and duty/responsibility. Empirical data was collected to
evaluate the applicability of the model to the Antarctic region through 15 semi-structured qualitative interviews over Zoom with guides in August-November of 2022. Convenience sampling was used to recruit polar, both Arctic and Antarctic, guides through the Polar Tour Guiding Association. Qualitative data was analyzed using a mixture of thematic and deductive methods on NVivo software. Analysis confirmed four major themes of protected area ambassadorship: place attachment, community, capacity, and duty/responsibility, with 13 sub-themes that emerged inductively. The conceptual model proposes multi-level ambassadorship, and four interconnected dimensions represent the iterative process by which ambassadorship develops. The conceptual model of PAA seems to be applicable across the polar regions and could be used to better understand the link between values and actions for a variety of populations, potentially in a variety of settings.

As climate change continues to highlight the critical and urgent need for the public to engage with and advocate for environmental conservation, these two respective studies should contribute to the growing body of knowledge around facilitating conservation behavior among different populations. Knowing how to communicate with diverse audiences regarding nature and knowing the dimensions that influence capacity to act as protected area ambassadors, can help to connect different people with conservation issues, fostering stewardship across diverse populations and environments.
Exploring Connection to Nature as a Pathway to Local and Global Conservation Actions: Two Exploratory Studies in North Carolina and Antarctica.

by
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DEDICATION

To my wonderful family and friends, my parents, Jim and Wesley Reas, and my partner, Michael Nantais, for all their unwavering support, love, and encouragement over the years. This would not have been possible without them. And to Lesa and John Beckett and Peggy Prickett, who would have been proud of this too.
BIOGRAPHY

Julianne was born and raised in Charlotte, North Carolina. After graduating from high school in 2016, she attended North Carolina State University and graduated summa cum laude with a Bachelor of Arts in Communication in 2020. During her time as an undergraduate, Julianne discovered her interest in protected areas and began exploring different ways she could contribute to conservation efforts. She began by founding an on-campus organization that connected over 700 students to the outdoors through recreational and volunteer experiences. This, plus experiences as an undergraduate researcher on a visitor use management project, and as an AmeriCorps member in Raleigh working on food security issues, led her to pursue a Masters in Natural Resources at her alma mater. Julianne hopes to use the knowledge and skills gained in this master’s to help address climate change.
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CHAPTER 1
INTRODUCTION

The impacts of a warming climate are felt by people and ecosystems at every scale, and the high likelihood of continued warming to 1.5-2°C due to greenhouse gas emissions will continue to exacerbate and compound effects (Dietz et al., 2009; Intergovernmental Panel on Climate Change [IPCC], 2023; Strand et al., 2023). Human behavior, specifically unsustainable land use, industry, and consumptive lifestyles, have released greenhouse gas emissions totaling 415 parts per million in 2019 (IPCC, 2023; Trenberth, 2018). All the systems that support life and biodiversity, and unfortunately, the most vulnerable populations are and will continue to be the most impacted (Akerlof et al., 2015; IPCC, 2023; McMichael, 2014). The local and global scale of climate change requires solutions that address issues at each level. Adapting to a changing climate requires powerful social strategies that engage with multiple populations of stakeholders and foster individual pro-environmental behavior and collective action (Callison, 2014; Chawla & Cushing, 2007; Doyle, 2018; Quinn et al., 2015).

The environmental problems we are facing are a result of human behavior, therefore it is logical to assume that solutions lie in changing human behavior (Clayton, 2003; Davis et al., 2011; Dietz et al., 2009; Steg & Vlek, 2009). A common path towards changing behavior is by using education to raise awareness and knowledge; this sentiment is echoed in the literature and governmental climate frameworks (Carrico, 2022; Nelson et al., 2022; Heimlich & Ardoin, 2008; Richardson, 2023; Strand et al., 2023; Monroe, 2003; United Nations, 1992). Changing behavior in this context is often synonymous with increasing a person’s pro-environmental behavior (PEB), which are “behaviors that benefit the natural environment, enhance environmental quality or harm the environment as little as possible” (Steg & Vlek, 2009, p. 309). This approach is valuable, although simply increasing the knowledge of an audience has not been shown to increase PEB intentions alone (Heberlein, 2012; Nelson et al., 2022). The inefficiency of this is likely due to the complex interactions and sometimes inflexibility of behavioral antecedents of values, beliefs, norms, and attitudes that govern human behavior on individual and collective levels (Bradley et al., 2020; Heimlich & Ardoin, 2008; Larson et al., 2015; Steg et al., 2016). The likelihood that an individual would be influenced to take action by an educational program on climate change, per say, has to do with their underlying beliefs which construct their general worldview, the values guiding their priorities and preferences, internal or external motivators or
goals associated with the behavior, and the situational factors such as social norms that further encourage or restrain action (Clayton, 2003; Heberlein, 2012; Steg et al., 2016; Steg & Vlek, 2009; Stern et al., 1999; Stern, 2000). Although more biospheric or altruistic values have been linked to pro-environmental behavior intentions across public and private behaviors (Confente & Scarpi, 2021; Kim & Koo, 2020; Schwartz, 1977; Stern 2000; Sharpe et al., 2021; Tamar et al., 2020), values are consistent over time and are hard to change in isolation (Kim & Koo, 2020; Landon et al., 2019). Attitudes, “positive or negative evaluation of an object,” are more malleable components of a person’s value system that can predict behavior (Ajzen, 1991; Bohner & Dickel, 2011; Clayton, 2003; Tamar et al., 2021). Attitudes have the potential to be influenced by education and knowledge-building, potentially due to the component of affect (Landon et al., 2019; Powell & Ham, 2008; Serenari et al., 2012; Stern et al., 2014).

Facilitating the experiences necessary for the development of a concerned public that is ready and willing to engage in conservation action may rest on our ability to tap into emotions. Potentially motivating for pro-environmental behavior is affect, or the moods and emotions that occur in response to stimuli either consistently (trait affect) or with variability (state affect) (Coelho et al., 2017; Watson, 2000). Positive affect is usually linked to PEB through concepts of nature relatedness, connection to nature, place attachment, and even environmental self-identity (Brehm et al. 2013; Keith et al., 2022; Halpenny, 2010; Landon et al., 2019; Larson et al., 2018; Manzo, 2005; Nicolosi & Corbett, 2018; Nisbet et al., 2011; Scannell & Gifford, 2013). These concepts are concerned with the affective measures of a person’s relationship with nature, in general, or a specific place, and their attachment. Place attachment can be defined as the “formation of emotional and cognitive bonds with a particular place” (Scannell & Gifford, 2013, p. 66). Connection to nature measures the “affective, experiential sense of oneness with the natural world,” (Mayer & Frantz, 2004, p. 504) and nature relatedness expands this by including “an appreciation for and understanding of our interconnectedness,” (Nisbet et al., 2009, p. 718). Just as those with well-developed place attachments can form place identity, those with a connection to nature may be more likely to form an environmental self-identity, or the “extent to which you see yourself as a person who will act environmentally,” (Brugger et al., 2011; van der Werff et al., 2013; Scannell & Gifford, 2013; Nisbet et al., 2009; Tam, 2013; Wilkie & Trotter, 2022). Creating positive affective responses to environmental issues can also decrease the psychological distance of climate change impacts that exist for most of the public (Landon et al.,
As environmental risks are generally perceived as distant or non-threatening to daily life, people’s “worry about climate change, or their affective reaction” is low (Steynor, 2021). Risk perception plays a large role in activating environmentally responsible behaviors, but this depends on individual being able to identify with that messaging (Clayton, 2003; IPCC, 2023; Lo & Chan, 2017; Smith & Mayer, 2018; van Valkengoed & Steg, 2019).

There are multiple stages of a person’s life where fostering a positive human-nature relationship can make an impact on environmental behavior. The first is in the elementary years of childhood when strong evidence shows that the formation of affective relationships with nature can lead to pro-environmental behaviors into adulthood (Collado et al., 2013; Chawla, 1998, 2007; Chawla & Derr, 2012; Tanner, 1980; Wells & Lekies, 2006). To foster these connections, environmental education (EE) is often a tool used in both formal (e.g., classroom) and informal (e.g., practical) settings to “increase people’s knowledge and awareness about the environment and its associated challenges… and foster attitudes, motivations, and commitments to make informed decisions and take responsible action” (Ernst & Theimer, 2011; Frantz & Mayer, 2014; North American Association for Environmental Education, 2023; UNESCO, 1977). Educators and researchers are increasingly called to evaluate the effectiveness of programming by measuring program outcomes, including connection to nature. The challenge with this is that the term nature may be interchangeable with related terms, such as outdoors or outside, and these concepts may vary in distinct ways for people of various racial, ethnic, or gender groups. The energy around increasing diversity, equity, and inclusion in environmental programming has led to debate around the language used in programming and measurement tools (ReThink Outside, 2021). More research is needed to understand how the use of language may impact measurement of connection to nature and related concepts, particularly among diverse groups of elementary-aged students. The first study of this thesis (Chapter 2) was conducted with fourth and fifth grade students in North Carolina schools to investigate the role of language in assessing connections to nature and the effect that language may have in engaging minority groups with the environment. In North Carolina, a state with a robust network of environmental education educators and centers, connection-to-nature evaluative materials are often used to gauge the effectiveness of programming. Ensuring the language used in evaluations is culturally responsive will allow programs to be more inclusive, ultimately ensuring that
everyone, regardless of background or lived experience, is ready to engage with environmental challenges.

Childhood is not the only stretch of time where connection to nature can be promoted and developed. Adult education, despite its challenges of changing values and reaching captive audiences, can also be effective at increasing pro-environmental behavior in the right contexts (Nelson et al., 2022). Perhaps the most logical avenue for reaching these adult audiences is through nature-based tourism and travel. Outdoor experiential education in nature-based tourism can provide the conditions necessary for behavior change (Jacobs & Harms, 2014; Landon et al., 2019; Larson et al., 2018; Lin & Lee, 2020; Powell & Ham, 2008; Powell et al., 2008; Schwass et al., 2021; Ting & Cheng, 2017). A well-documented explanatory variable for this may be the increase of affective or emotional connections; within this literature there are multiple conclusions made about the effectiveness of this. For instance, increases in general emotional connections may not be the biggest indicators of behavioral intent, as seen in a study of National Outdoor Leadership School (NOLS) participants (Baird et al., 2022), but more specific affective connections, like place attachment or emotional epiphanies, have been linked to PEB (Halpenny, 2010; Kim & Koo, 2020; Larson et al., 2018; Miller et al., 2020). Within Antarctica, a highly sensitive protected area, this phenomenon has been adopted and promoted as an outcome of the educational and transformative experience that tourism provides. “Antarctic Ambassadorship” is a concept that links educational experiences to pro-environmental behaviors for all visitors to the region; however, the efficacy of this on the average tourist is debated, and the mediators of behavior in this context are not clearly defined. Study two (Chapter 3) of this thesis aimed to define and expand the dimensions of protected area ambassadorship through the lens of polar tour guiding, a population of interest whose ambassadorship has been little explored in this context. The potential impacts of understanding tour guiding’s conceptual overlap with ambassadorship could result in increased recognition of their own PEB, their role in influencing tourists’ behavior, and their contribution to environmental conservation globally.

It is within these concepts of connection to nature that the following research lies. My interdisciplinary background in communication studies and interest in the human dimensions of natural resource management led to the development of these studies. Though they may seem disparate at first glance, the underlying motivation to understand the influences on and motivators of connection to nature across populations with varying backgrounds and influences,
unites them. The complex task of adapting to a changing climate requires that humans, at various stages of life and ability, begin reconceptualizing their relationship to nature and the environment. Through the promotion of social strategies such as fostering connection to nature and strong commitments to conservation, we may be able to develop a motivated public that is up to the task of addressing climate change. This thesis analyzes aspects of these social strategies in two different contexts, through two independent, but connected studies.
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CHAPTER 2
NATURE OR THE OUTDOORS? UNDERSTANDING THE POWER OF LANGUAGE IN ELEMENTARY STUDENTS’ SELF-REPORTED CONNECTION TO NATURE

Abstract

Many previous studies have measured elementary-aged students’ connection to nature, but few have explicitly considered how the use of different terminology (e.g., “nature” vs. “the outdoors”) can influence those connections. We utilized a quasi-experimental design to test for differences in affective and self-reported connections to nature among diverse groups of fourth and fifth grade students from two elementary schools in Wake County, North Carolina. We used Mann Whitney U tests to compare these outcomes between two versions of a survey, one using the word “nature” ($n=112$) and one using the word “outdoors” ($n=113$), for (1) the whole sample, ($n=225$) (2) between boys and girls, and (3) between students of color and white students. Self-reported connection to nature did not vary significantly based on terminology used, but we did find some differences in levels of emotional affinity that students associated with each term. Our results suggest that the differences in which young audiences perceive the terms “nature” versus “outdoors” are nuanced and may offer insight into how language about the environment may invoke different emotions among children.
Connection to nature (CTN), “one’s affective, experiential sense of oneness with the natural world,” (Mayer & Frantz, 2004, p. 504) is linked to improved physical and mental health (Cheng & Monroe, 2012; Jackson et al., 2021), increased psychological well-being (Summer et al., 2019; Wolsko & Lindberg, 2013), and the development and retention of pro-environmental behaviors and attitudes (Hoover, 2021). It is well-documented that a lifelong connection to nature can be facilitated through childhood experiences in the outdoors (Chawla, 1998; Chawla and Cushing 2007; Ernst & Theimer, 2011; Hoover, 2021; Tanner, 1980; Wells & Lekies, 2006). Acknowledging these diverse benefits, environmental education (EE) programs are often designed to promote and provide childhood experiences that build CTN and generate a variety of positive outcomes (Liefländer et al., 2013). Additionally, educators and researchers are increasingly called to evaluate the effectiveness of programming in facilitating CTN, highlighting the importance of accurate measures that have practical implications for promoting individual well-being and conservation behavior (Barrable & Booth, 2020).

Connection to nature is measured in a variety of quantitative and qualitative ways, assessing both children and adults’ affective (emotion), cognitive (knowledge) and behavioral (action) associations with nature (Baird et al., 2022; Salazar et al., 2020; Whitburn et al. 2020). Discussion around CTN measurement has primarily centered on defining what is meant by “connectedness” and the various dimensions of human-nature relationships, with some researchers calling for inclusion of more interdisciplinary definitions (Ives et al., 2017; Whitburn et al., 2020). Measuring connection often involves a complex assessment of cognitive and emotional components that can gauge stewardship behaviors or simply feelings of comfort or belonging (Kals et al., 1999; Perrin & Benassi, 2009; Salazar et al., 2021).

Another layer of discussions centers on the object of connection — nature. Literature from psychology and communication fields define “nature” as a psychological construct that is socially constructed by people (Baindur, 2015; Ducarme & Couvet, 2020). These scholars emphasize the subjective influences of culture, history, and lived experience on conceptualizations of nature. Implications of conceptual differences can be subtle but meaningful, such as in the ways people may perceive themselves as a part of or separate from nature, or in regard to a person’s support for conservation action or individual pro-environmental behavior. For instance, trying to understand a person’s relation to nature based on the common
“Inclusion of Nature in Self” scale may vary based on broad cultural or experiential differences (Mikołajczak et al., 2021). While this scale measures “the extent to which individuals include nature within their views of themselves,” there is a baseline assumption that the concept of nature is objective and consistent across time and cultures (Baindur, 2015; Schultz, 2002; Salazar et al., 2020, p. 34; Tomasso et al., 2021). Of course, that is not always the case (Arora-Jonsson & Ågren, 2019; Bang et al., 2007; Buijs, 2009). Although this conversation around how people define nature is not completely missing from research on connection to nature (Collado et al., 2016; Mayer & Frantz, 2004; Randy & Walker, 1999; Tillman et al., 2019), it has received little empirical attention.

One aspect of this definitional challenge is the degree to which the term nature may be interchangeable with related terms, such as “outdoors” or “outside.” These terms appear in literature both as synonyms and as concepts that vary in distinct ways for different groups of people (Buijs, 2009; Buijs & Elands, 2013; Farjon et al., 2016; Keulartz et al., 2004). For example, Dashper & King (2022) specifically utilize a conceptualization of “the outdoors” that encompasses leisure in both local and far environments, which is typical for leisure research (Martin, 2004). However, while exploring inequalities and access of outdoor leisure participation due to social constructions of space, they fail to explore the implications of those conceptualizations being synonymous with “nature” (Dashper & King, 2022). One recent contribution to this conversation is the ReThink Outside campaign. In an effort to ensure the benefits of CTN are widely accessible, the Blue Sky Funders Forum funded extensive message testing with the words: nature, outside, and outdoors, in order to determine the most culturally responsive terminology (ReThink Outside, 2019). Adults in their study identified nature as the least widely resonant; they characterized the word as elitist, while outdoors/outside were more relevant and applicable across diverse contexts due to their connection with activity and perceived distance from political meanings. Additionally, respondents were more likely to associate outdoors/outside as encompassing of built environments and urban areas, which is consistent with previous research (ReThink Outside, 2019; Tomasso et al., 2021). This terminology confusion has many implications for practice. If the word nature has historically been used — both intentionally and inadvertently — in exclusionary ways (ReThink Outside, 2021; Virden & Walker, 1999), this may point to challenges when measuring CTN.
Similarly, research on CTN, or related variables such as patterns of outdoor recreation and leisure behavior, setting preferences, or comfort levels in nature, has revealed nuances across ethnic, racial, and gender groups (Askins, 2009). These differences may also influence accurate measurement of CTN. Studies have shown, for instance, differences in nature-based recreation participation and connections to nature are influenced by gender identity (Colley et al., 2022; Rosa et al., 2023). Early research on leisure patterns assumed people of color did not enjoy being in nature, noting that their lack of participation ran contrary to the leisure patterns of the dominant group (i.e., White recreationists in wilderness environments) (Floyd, 1998; Shinew et al., 2004). Eventually, recreational preferences were understood to stem from “socio-economic marginality, collectivist culture, [or] different conceptualizations of nature,” rather than an inherent disinterest in nature (Floyd, 1998; Floyd et al., 2008; Shinew et al., 2004; Stern et al., 2010; Ordóñez-Barona, 2017, p. 68; Washburne, 1978). Due to historical discrimination and marginality, outdoor spaces are intertwined with segregation, inequality, violence, and fear among many women and people of color — all of which can influence comfort in and connection to nature broadly (Rosa et al., 2023; Wesely & Gaarder, 2004; Larson et al., 2011b; Soroye et al., 2020; Finney, 2014). Historical discrimination still impacts racial and ethnic minority communities’ relationship to the natural world, as these communities bear the brunt of environmental hazards and have less access to green space due to historical practices such as redlining and ongoing discrimination in both nature and outdoor settings (Lewis, 2022; Mullenbach et al., 2022; Rigolon et al., 2021).

Given the growing enthusiasm for diversity, equity, and inclusion efforts designed to address these historical injustices and increase CTN and associated benefits across diverse populations (Arora-Jonsson & Ågren, 2019), understanding the nuances of language used in this work is increasingly important. Measuring concepts related to CTN can ensure programs maximize the benefits of nature and help build healthy communities. More research is therefore needed to understand how the use of language may impact measurement of connection to nature and related concepts, particularly among diverse groups of students. The importance of early interventions creates a strong need to both develop nature-based programming for young students and to have appropriate tools to measure effects on CTN following these experiences. Examining how diverse groups of students respond to language around nature (e.g., nature, outdoors, outside) can ensure programs and associated measurement tools resonate with broad
audiences. If measurement scales utilize terminology interchangeably without considering the weight of the associated words for different groups, they may be misrepresenting the extent to which populations are reporting feeling connected (Acree & Chouinard, 2020; Anderson et al., 2022; Stern et al., 2010). This could have implications for outreach and program development. For instance, if people ascribe meaning to the term “outdoors” that includes something more urban than the term “nature,” we should understand the potential differential benefits of feeling connected to these different types of settings (outdoors vs. nature). Additionally, comparison across studies and scales would be much more accurate if a common vocabulary was used (Collado et al., 2016).

This study begins to fill these research gaps by comparing responses associated with two nearly identical measurement tools, both measuring CTN, but one using the term “nature” and the other using the term “outdoors,” among elementary school students in NC ($n = 225$). The decision to test “outdoors” to “nature” rather than “outside” was due to the higher instance of “the outdoors” used interchangeability with nature and use in relation to CTN (Dashper & King, 2022). Often grammatically, “outdoors” is also used more frequently to describe activities, time, and physical spaces (i.e., “The Great Outdoors,” outdoor recreation, time outdoors) (Baker et al., 2022), but besides the “ReThink Outside” campaign there is little empirical exploration into these differences. The objectives for this study are (1) to characterize the emotional valence and intensity that elementary-aged students’ associate with the term nature compared with the term the outdoors, (2) to examine how self-reported CTN levels differ when scales use the word “nature” versus “the outdoors” and (3) to assess whether these emotions and reported CTN, as measured by the word “nature” versus “the outdoors,” vary across demographic groups including different racial and gender identities.

Methods

Sampling

We drew our sample from two elementary schools in Wake County, North Carolina. Wake County elementary schools have a student population of 68,635 across 120 schools, with 57.6% of students identifying as people of color (Wake County, 2023). Elementary school students, specifically 4th-5th graders, were chosen because of evidence showing that CTN declines after the 10-year age mark and tends to be strongest around 4th-5th grade (Barrable &
Booth, 2020; Richardson et al., 2019). We contacted over 60 elementary school teachers across North Carolina through a previously established email list of educators that expressed interest in being involved with research opportunities through the Environmental Education Lab at NC State. Researchers offered optional compensation of a $20 gift card to the first 20 teachers that agreed to participate in distributing the survey, regardless of whether or not students decided to participate. Students were provided with the option to not participate at the start of the survey, and teachers used an age-appropriate verbal script discussing meaningful assent to the students at the start of the survey. We were given approval for a waiver of the requirement of consent for parental permission by the IRB humans’ subjects research office at NC State University (Protocol #24540) prior to implementation.

Two teachers volunteered, both within Wake County. The first school was located in densely-populated North Raleigh, with 41.2% of students identifying as people of color and 58.7% identifying as White. School-recorded gender identities totaled 52.5% male and 47.5% female. The 2nd school was located in a less densely populated area closer to rural, agricultural land. School demographics reported 50.2% male and 49.7% female students in attendance, with 43.8% of students identifying as people of color and 56.2% as White (Wake County, 2023). Both volunteering teachers taught multiple classes and administered the survey in the spring 2022 and fall 2022 semesters, representing two separate school years. Though this participation rate was below what we were anticipating, it was in line with similar studies with schools during and immediately following the COVID-19 pandemic (Hartley et al., 2021, 2023). In total, the usable sample of students totaled 225 students across 13 different classes.

Study Design

This study was structured as a quasi-experimental design, where students randomly received one of two nearly identical versions of an online survey via the randomization feature in Qualtrics software. The only difference in the two versions of the survey was the use of the term “nature” ($n=112$) versus “the outdoors” ($n=113$). The open-ended first question within each version of the survey prompted students to begin thinking about the relevant term at hand (Vaske, 2008): “When I think of [nature/the outdoors], I think of…” The next three questions asked students about three emotions toward nature or the outdoors. They were asked whether nature/the outdoors made them feel happy or sad; excited or calm, and comfortable or nervous,
with five response options between each polarized pairing. For example, one question read “When I think of [nature/the outdoors], I feel...”, with options ranging from 1 = ‘really sad’, 3 = ‘in-between’, and 5 = ‘really happy.’ A similar approach has been used with children (Larson et al., 2011a) to capture the valence and intensity of cognitive and emotional responses to nature (Bradley & Lang, 1994; Kals et al., 1999). Next, the students were asked to respond to one of two versions of the Nature Connectedness Index (NCI, Richardson et al., 2019) with either the term “nature” or “the outdoors” in each of the six scale items, depending on the treatment. Example items included: “Tell us if you agree with the following statements,” for items such as “I always find beauty in [nature/the outdoors].” Students responded by selecting one of five scale points where they chose a symbol of two thumbs down, one thumb down, a question mark symbol to indicate neutrality, a thumbs up, or two thumbs up; these symbols were utilized to enhance understandability with young research participants, who may still be fairly new to reading. This technique is validated in previous literature (Collado et al., 2013; Kosmoski et al., 1994). Finally, students self-reported race/ethnicity (White or Caucasian, African-American, Hispanic, Asian or Pacific Islander, Native American) and gender (boy, girl, non-binary, in a way not listed here, prefer not to answer). For a full version of the survey, see the appendix.

Analysis

We completed our quantitative analysis in the statistical software program STATA. We first assessed the reliability of both the “nature” and “the outdoors” versions of the NCI using the criteria of Cronbach’s Alpha > 0.70 (Hair et al., 2014). We evaluated the validity using principal component analysis, expecting both versions of the NCI to load on a single factor with factor loadings of at least 0.4 (Comrey & Lee, 1992). Both measures met acceptable thresholds (see Appendix E). We calculated composite scores for each version of the NCI scale by averaging items, resulting in possible scores ranging from 1 to 5 for each version. Due to small sample sizes of the demographic groups ($n <100$), we collapsed demographic groups into binary categories (i.e., students identifying as White versus students of color; girls versus boys) and used non-parametric tests to address our hypotheses. The collapsing of groups into broader categories facilitated the statistical analysis of a small sample of categorical data; however, we acknowledge the reality that race, ethnicity, and gender are not homogenous and should not always be represented as such (Ross et al., 2020). We used non-parametric Multiple Mann-
Whitney U tests to compare mean emotional valence scores (happiness, calmness, and comfort; research question 1) and NCI scores (research question 2) across the nature versus outdoors versions of the survey for the whole (Meier, 2009). We also compared responses to each term among different demographic groups using Multiple Mann-Whitney U tests (research question 3). For example, we compared the mean happiness scores across the whole sample as well as for students of color across nature versus outdoor samples.

Responses to the open-ended question were coded using NVivo, a qualitative analysis software, to identify similar and diverging themes between the nature and outdoors surveys. We used inductive, data-driven coding to allow for themes to emerge outside of pre-existing frameworks (Nowell et al., 2017). The principles of trustworthiness were ensured through peer debriefing, referential adequacy, use of audit trails, and method triangulation, using qualitative results to contextualize quantitative trends (Decrop, 2004).

Results

Respondent demographics reflected the two schools and the general Wake County, NC, elementary school student population. Differences in totals compared to overall survey responses for race/ethnicity are due to students \(n=5\) or 2.2% opting out of self-reporting racial and/or ethnic identities. In our sample, 122 students identified as people of color (54.2%), and 98 as White (43.5%) (school 1: 42 or 46% vs 49 or 53%; school 2: 80 or 62% vs 49 or 37%), reflecting the 57.6% of students identifying as people of color across Wake County elementary schools. Responses to the gender identity question were collapsed into binary (boy/girl) categories. Because we chose an analysis based on binary categories, we decided to exclude students \(n=38\) or 16.8% that identified as one of the other options (non-binary, not in a way listed here, prefer not to answer), accounting for the difference in totals for gender. We acknowledge this decision has several implications at odds with our goals of supporting equitable programming, which we address in the discussion. Of the students included, respondents were fairly evenly distributed by gender, with 102 boys (45.3%) and 85 girls (37.7%) for the whole sample, (school 1: 47 or 56% vs 37 or 44%) (school 2: 55 or 53% vs 48 or 46%). Boys outnumbered girls across the elementary school system (35,403 or 51.8% vs 33,518 or 48.6%) and across individual schools (school 1: 403 or 53% vs 356 or 46%; school 2: 311 or 50.2% vs 308 or 49.8%) as well.
Emotional affinity

When comparing responses across the whole sample, Mann-Whitney U tests revealed statistically significant evidence that students reported feeling calmer when responding to nature ($M=2.57$, $SD=1.18$) as compared to the outdoors ($M=3.03$, $SD=1.20$; $p=0.002$; $z=-3.04$; Figure 1). Slight differences in scores on the sad to happy scale (nature: $M=4.00$, $SD=0.80$; outdoors: $M=4.09$, $SD=0.86$; $p=0.38$, $z=-0.88$) and nervous to comfort scale (nature: $M=4.02$, $SD=0.73$; outdoors: $M=3.81$, $SD=1.05$; $p=0.23$, $z=1.20$) were not significant (Figures 2, 3 respectively).

Analyses revealed additional variance in emotions across demographic groups. Students that self-identified as girls were more likely to report feeling calm when responding to the term nature versus the outdoors (nature: $M=2.65$, $SD=1.26$; outdoors: $M=3.27$, $SD=1.01$; $p=0.01$; $z=-2.48$; Figure 1). We did not observe significant differences for boys’ reported scores (nature: $M=2.60$, $SD=1.14$; outdoors: $M=2.91$, $SD=1.24$; $p=0.14$, $z=-1.47$), although mean scores reflected similar trends as the girls’ scores. Similar patterns were identified across racial/ethnic groups for students of color (nature: $M=2.53$, $SD=1.16$; outdoors: $M=2.91$, $SD=1.30$; $p=0.010$; $z=-1.67$). White students (nature: $M=2.56$, $SD=1.19$; outdoors: $M=3.23$, $SD=1.01$; $p=0.002$; $z=-3.13$) reported feeling more calm than excited on the nature survey. No distinct patterns were found between demographic groups on the happy to sad scale, with the majority of students reporting high levels of happiness on both “nature” and the “outdoors” surveys (nature: $M=4.00$, $SD=0.80$; outdoors: $M=4.09$, $SD=0.86$) (Figure 2). Girls reported higher levels of comfort in nature (nature: $M=4.16$, $SD=0.64$; outdoors: $M=3.71$, $SD=0.97$), as they were more likely to associate the outdoors with more feelings of nervousness ($p=0.02$; $z=2.32$).
Figure 2.1 Mean values of emotional affinity (calm to excited) across different demographic groups of NC students for nature (n=112) and the outdoors (n=111).

*, **, and *** denote statistical significant differences between nature and outdoors for each demographic group for Mann-Whitney U-test at p <0.05, <0.01, and <0.001, respectively.
**Figure 2.2.** Mean values of emotional affinity (sad to happy) across different demographic groups of NC students for nature (n=107) and the outdoors (n=104).

*, **, and *** denote statistical significant differences between nature and outdoors for each demographic group for Mann-Whitney U-test at p <0.05, <0.01, and <0.001, respectively.

![Nervous to Comfortable Scale](image)

**Figure 2.3.** Mean values of emotional affinity (nervous to comfortable) across different demographic groups of NC students for nature (n=112) and the outdoors (n=111).

*, **, and *** denote statistical significant differences between nature and outdoors for each demographic group for Mann-Whitney U-test at p <0.05, <0.01, and <0.001, respectively.

**Nature connectedness**

The reliability of the aggregated 6-item Nature Connectedness Index (NCI) was high for both the “nature” (Cronbach’s alpha= 0.81) and “outdoors” version of the survey (Cronbach’s alpha= 0.88). Factor analysis confirmed all 6 NCI items loaded strongly onto factor one (≥0.4), connectedness to nature, for both “nature” and “outdoors” surveys. Factor one on the “nature” survey (nature: \(M=4.09\)) had an eigenvalue of 3.01 (50% of the variance). Factor one on the “outdoors” survey \(M=3.96\) had an eigenvalue of 3.83 (64% of the variance) (Table S2). Our Mann-Whitney U tests revealed no statistically significant differences between student responses on the “nature” and “outdoors” versions for the whole sample: nature (\(M=4.09, SD=0.67\)) and
outdoors ($M=3.96$, $SD=0.88$; $p=0.57$, $z=0.56$), racial groups: White ($p=0.12$, $z=1.57$) and Students of color: ($p=0.55$, $z=-0.60$), or gender groups: boys ($p=0.88$, $z=0.15$) and girls ($p=0.86$, $z=0.18$) (Figure 4). More differences in variance appeared for students of color on “outdoor” responses ($M=3.98$, $SD=0.98$), than for “nature” ($M=4.02$, $SD=0.72$). Similar scores and variance were found for boys on both the nature survey ($M=4.06$, $SD=0.79$) and the outdoors survey ($M=4.06$, $SD=0.74$). Less variance appeared for girls on the nature survey ($M=4.20$, $SD=0.50$) than on the outdoors survey ($M=4.12$, $SD=0.70$), though mean scores remained similar.

![Nature Connectedness Index](image)

**Figure 2.4.** Mean values of two versions of nature connectedness index scores for the whole sample nature ($n=112$) versus the outdoors ($n=113$) and across gender and race.

**Qualitative Results**

Themes that emerged from the open-ended question reflected themes identified in previous research focused on students’ conceptualizations of nature. Students’ mention of either isolated elements or interacting environmental systems are common ways they express their
understanding of nature (Collado et al., 2016; Flowers et al., 2015; Larson et al., 2011a). Isolated elements (e.g., trees, rivers) emerged as a dominant theme for both terms in this study (nature, n=68, outdoors, n=45) with fewer students mentioning systems (nature, n=4, outdoors, n=6) (e.g., watersheds; climate). One study using the same open-ended question found similar trends; students tended to describe parts of nature, emotional experiences, or human-nature relationships rather than focusing on an ecosystem as a whole (Collado et al., 2016). Another dominant theme in the qualitative data, which speaks to the potential interchangeability of terms, was the large number of students who viewed and listed nature as part of the outdoors (n=30). On the other hand, fewer students mentioned the outdoors as part of nature (n=11).

Although human-nature relationships were mentioned by a few students in our study, the emotional experiences and elements of nature were dominant themes. The mental health theme was more evident on the nature survey, with more than twice as many students noting the benefits of nature, although the same amount of negative aspects were associated with both terms (e.g., allergies, bad weather). Students expressing the stress-relieving benefits of spending time in nature described, “subtle calming sounds like a release from social stress;” such comments were less present on the outdoors survey (n=27 vs 12). Alternatively, more students on the outdoors survey described how they spent their time outside, mentioning physical activity and sports (n=36 vs 22). Qualitative results also validated some of the nuances found on the emotional affinity scales. For instance, on the nervous/comfortable quantitative scale, many students (especially girls) associated nervousness with “the outdoors.” Some students expressed general discomfort with both nature and the outdoors (n=7 vs 7), with a couple students expressing statements resonate of climate anxiety (n=2) (Bonnett & Williams, 1998). Main reasons for discomfort varied from feeling fear, “I am scared of bugs and insects, but I love science and research. I will go on nature hikes and think they are scary but I end up liking it,” to discomfort due to heat or bugs, “I don't really like nature because I am allergic to trees, grass pollen, weeds and dust.”

Table 2.1 Comparison of themes and corresponding codes from open-ended survey question on “nature” and “outdoors” survey completed by students in NC

<table>
<thead>
<tr>
<th>Nature</th>
<th>The Outdoors</th>
</tr>
</thead>
</table>

29
<table>
<thead>
<tr>
<th>Theme</th>
<th>Description of Theme</th>
<th>Number of Mentions</th>
<th>Example Survey Response</th>
<th>Number of Mentions</th>
<th>Example Survey Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benefits</td>
<td>Kids mentioned mental, physical, and emotional health benefits</td>
<td>27</td>
<td>“happy, it is like freedom”</td>
<td>12</td>
<td>“A very beautiful place that should be more taken care of”</td>
</tr>
<tr>
<td>Cost/ drawbacks</td>
<td>Kids mentioned dislikes</td>
<td>7</td>
<td>“Gets boring”</td>
<td>7</td>
<td>“How hot it is” “I don’t like playing outdoors”</td>
</tr>
<tr>
<td>Systems Thinking</td>
<td>Kids mentioned either isolated and interrelated elements of the environment; or terminology</td>
<td>68</td>
<td>“How our climate is being affected dramatically and how many plants and animals are dying”</td>
<td>45</td>
<td>“Water cycle” “Deforestation”</td>
</tr>
<tr>
<td>Type of use</td>
<td>Kids mentioned participating in physical activities: hiking, walking,</td>
<td>22</td>
<td>“Playing games”</td>
<td>36</td>
<td>“Playing football and running” “Playing outside”</td>
</tr>
</tbody>
</table>
Discussion

Many previous studies have measured elementary-aged students’ connection to nature, but this is one of the first studies to explicitly consider how the use of different terminology (e.g., “nature” vs. “the outdoors”) can influence those connections. Measuring CTN using either “nature” or “the outdoors” did not seem to impact the students’ level of connection; however, nuances were observed with respect to emotional affinity for “nature” and “the outdoors.”

Overall, the full-sample comparison of self-reported connection to nature versus connection to the outdoors resulted in very few significant differences between the surveys, even when comparing gender identity and racial/ethnic groups. In the US, there is increasing debate over which terminology is the most inclusive, and significant energy has been dedicated to shifting away from “nature” based on extensive market research with adults that uncovered clear differences in how those terms are received (ReThink Outside, 2021). However, our results suggest that perceptions of and responses to the term “nature” versus “outdoors” are similar among youth, at least in terms of the sense of connections prompted by those terms. While “nature” or “outdoors” for adults may hold meanings related to the historical discrimination and exclusionary practices meant to separate people, and specific demographic groups, from the land, these are socially constructed and learned concepts (Dashper & King, 2022; Ho & Chang, 2021; Puelzl et al., 2021; Martin, 2004; Mikołajczak et al., 2021; Ordóñez-Barona, 2017; Weber & Sultana, 2013). Considering the decrease in CTN around adolescence (Braun & Dierkes, 2017), these conceptualizations may be due to developmental and external influences that are responsible for the association of “nature” with specific social and cultural meanings (Grenno et al., 2021; Kellert, 2002; Summers et al., 2019). Our results may show pre-adolescent students have yet to learn these constructed meanings, so perhaps forming connections early and addressing these realities can provide an opportunity to redefine what nature means, getting away from that exclusionary past to encompass something more inviting to all (Barrable & Booth, 2020).

We did detect variation in relation to emotional affinity, which aligns with prior research highlighting the range of both positive (i.e., happiness, joy, comfort) and negative (i.e., fear, discomfort) feelings derived from the natural world (Bixler & Floyd, 1997; Tillman et al., 2019; Tomasso et al., 2021). Emotions have been hypothesized as a “scaffolding” for pro-environmental behavior (PEB); they are less accurate predictors of specific behavior than
cognitive connections, but they often help to create the conditions necessary to stimulate and reinforce PEB (Baird et al., 2022, p. 1907; Halpenny, 2010). We also found in qualitative responses that, in general, students were more likely to mention benefits associated with nature (e.g., happiness, beauty) than the outdoors. Negative responses to both nature and the outdoors were also reported and resonant of previous studies that found associated fears to environmental factors (Bixler & Floyd, 1997). Students that did mention benefits of the outdoors were more likely to describe the visual beauty they observed, whereas, in regards to nature benefits, students described positive emotional responses, such as “peace” or “calmness.” The mental benefits that children associate with nature have been observed in previous studies (Aaron & Witt, 2011; Bonnett & Williams, 1998; Lekies et al., 2015; Tillmann et al., 2019). Studies that have examined children’s conceptions have focused solely on nature, with only a few comparing another term, “environment” (Aaron & Witt, 2011; Lekies et al., 2015; Payne, 1998). Perhaps the outdoors encompassing a wider variety of experiences, including more physically active ones (Dashper & King, 2022; Wesely & Gaardner, 2004), separates it from the view of experiences in nature as more isolated or “peaceful” (McLean, 2013; Rosa et al., 2023).

We observed higher levels of comfort and calm associated with the term “nature,” especially among girls. This pattern is supported by literature around how girls are socialized in general, as well as specifically to natural spaces (Floyd & Gramann, 1995; Bixler et al., 1994; Rosa et al., 2023; Tomasso et al., 2021). Qualitative responses revealed a clear association of the term “outdoors” with physical activities and sports, which several studies have shown are perceived as more masculine activities (Lin & Chen, 2013; Rasmussen et al., 2021; Wesely & Gaardner, 2004), and are in line with studies showing higher likelihood for participation in “nature-based recreation” from men, despite strong connectedness from women (Rosa et al., 2023, p. 148). Adolescent girls consistently rate maintaining their appearance and social time as more important than being physically active, often citing lack of opportunity or support for “masculine leisure behavior” as reasons not to engage in these activities (Whitehead & Biddle, 2008). For outdoor recreation, barriers expand to include safety concerns and nervousness related to animals or people, especially for youth alone in the outdoors (Biddle et al., 2005; Culp, 1998; Lekies et al., 2015; Robbins et al., 2003; Tillman et al., 2019). Some of these barriers were noted by students in our study. The same process that socializes girls into caregiving roles also teaches them that independence and risk-taking in the outdoors are not consistent with their femininity.
(Wesely & Gaardner, 2004; Whittington, 2006). As girls receive these messages and develop their identity, they may also find more comfort in nature rather than “the outdoors” due to their identification with the personified feminine characteristics of nature (i.e., Mother Nature) (Liu et al., 2019; Pfeifer & Berkman., 2018; Strapko et al., 2016; Virden & Walker, 1999; Way, 1995). Practitioners aiming to create programming that promotes both mental and physical health benefits may be able to do so by recognizing the gendered ways kids might be showing up, or not showing up, to these spaces. Encouraging kids, regardless of gender identity, to lean into the calmness that nature provides while also supporting them in participating in physical activity could be impactful (Rosa et al., 2023).

We did not find major differences in students’ conceptualizations of nature and the outdoors by race or ethnicity, based on the CTN scales. This finding suggests some interchangeability of this terminology in a context of measuring CTN, which is encouraging given the diversity of CTN measurements in use (Salazar et al., 2020). Further, it should be noted that better engagement with diverse audiences in outdoor and EE programming may not simply be remedied with strategic language shifts (Nxumalo & Ross, 2019). Language choices often reflect dominant narratives, and increasing inclusivity and diversity within EE requires examination of all facets of the experience, program content, marketing, and evaluation to incorporate culturally-sensitive and relevant practices (Anderson et al., 2022; Arora-Jonsson & Ågren, 2019; Stern et al., 2010). As McLean (2013) found, students lamented the disconnect of their outdoor educational experience from any critical analysis of environmental issues and risks that are situated within bigger historical and political systems. Intentionally incorporating these conversations into programming could be impactful for increasing adolescents’ participation in nature-based activities and PEB (Müller et al. 2019). Considering marginalized communities are often already more aware of environmental risks due to their disproportionate exposure to them, such an approach could be especially fruitful in those contexts (Lewis, 2021; Taylor-Clark et al., 2007). Ultimately, creating culturally responsive programming should mean incorporating reflexivity and honesty about how race, gender, privilege, and colonial histories have shaped environmentalism (Nxumalo & Ross, 2019). As our results show, this undoubtedly requires more than simple wording changes.
Conclusion/Future Research

Given the growing enthusiasm surrounding diversity, equity, and inclusion work in nature-based contexts, understanding the nuances of language used in these spaces is increasingly important. However, at least for students in our study, utilization of the different terms “nature” or “the outdoors” did not result in significantly different levels of CTN. Although each term yielded slightly different emotional responses, especially across gender identities, practical significance was minimal. It is important to ensure that the language used in programming and measurement is culturally-responsive, but our results indicate that — at least for late elementary-aged students — the difference in effectively engaging diverse audiences might have more to do with the content and structure of programs than the words used to describe them. Despite a desire to engage, without acknowledgement of the full interconnectedness of our social and ecological systems and a strong social justice focus, diverse audiences may continue to feel underrepresented or excluded in both nature and/or the outdoors (Baird et al., 2022; Finney, 2014; Warren et al., 2014). Often the desired outcomes of environmental education programming extend beyond simply promoting connection to nature to also incorporate social-emotional learning and positive youth development (Ardoin et al., 2022; Bowers et al., 2021). These outcomes can be better achieved when practitioners have the knowledge to help kids navigate these socio-cultural barriers.

Although we found few differences among how young audiences receive the terms, continued research around “nature” and “outdoors” is justified due to the subjectivity of how individuals conceptualize the words based on their own lived experiences. Considering the variance in connection among different age groups, and the decrease in CTN commonly occurring around adolescence (Hughes et al., 2019), future research could more explicitly survey that age group to assess differences in “nature” versus “outdoors” conceptualizations. Of particular need is more research associated with youth identifying outside of the boy/girl binary categories. Larger studies offer evidence that students identifying as non-binary or transgender benefit from outdoor experiences in terms of outcomes like self-efficacy, environmental attitudes, and place attachment (Braun, 2020), but none to our knowledge have explored conceptualizations of nature among these youth. Within these studies, testing other terms such as “outside,” in addition to or in place of “outdoors,” may reveal more conceptual differences, supporting development of welcoming programs. Including other outcomes commonly measured
in EE contexts, such as positive youth development, pro-environmental behavior, and social-emotional learning would also help broaden the understanding of the influence of these terms. Finally, researching practices that enhance inclusion and culturally-responsive programming may be more worthwhile endeavors than primarily focusing on the language used to describe these programs.
References


CHAPTER 3
GUIDED TOWARDS AMBASSADORSHIP: THE DEVELOPMENT OF A
CONCEPTUAL MODEL WITH ANTARCTIC TOUR GUIDES

Abstract

Collective climate action from tourism stakeholders is necessary for sustainable tourism to meet its goals. Nature-based tourism within protected areas is uniquely situated to encourage and facilitate stakeholder adoption of pro-environmental behaviors that can contribute to climate action. Protected area ambassadorship is a new term that could be used to describe this phenomenon more globally, and is a concept adapted from its usage in Antarctic tourism. Analyzing “Antarctic Ambassadorship” as a case study with polar tour guides, provides insights into the ambassadorship concept and its applicability across protected areas. Semi-structured qualitative interviews (n=15) with polar tour guides revealed four major themes and 13 sub-themes motivating PAA behavior: place, community, capacity, duty/responsibility. Data from the literature and interviews contributed to the development of a multi-level ambassadorship conceptual model. The conceptual model of PAA seems could be used to better understand the link between values and actions for a variety of populations, including the validation of polar tour guides as ambassadors.
Introduction

It is no secret that the co-occurring climate and biodiversity crises threaten to disrupt the current functioning of the tourism sector (Scott & Gössling, 2022; United Nations, 2005). The industry, which currently contributes an estimated 8% to global CO2 emissions, already sees impacts of the warming climate, and has responded with commitments to decarbonize and increase sustainability (Scott, 2021). The most recent, Glasgow Declaration on Climate Action in Tourism, led by The United Nations World Tourism Organization (UNWTO), places sustainable tourism with substantial stakeholder engagement, at the forefront of the response (One Planet, 2021; UNWTO, n.d.). Sustainable tourism, historically linked to the United Nations Sustainable Development Goals, recognizes the interconnectedness of social and ecological systems, and acknowledges the role tourism and its stakeholders must play in managing economic, social, and environmental impacts now and for the future (Bâc, 2014; Ballantyne & Packer, 2011; Buonincontri et al., 2017; Miller & Twinning-Ward, 2005; United Nations, 2005).

Tourism’s ability to decarbonize and adequately respond to a variety of global environmental impacts relies on collective action from stakeholders (Hwang et al., 2016; Lupp et al., 2016). Stakeholders involved can include a wide range of public and private entities, not limited to: government officials, tourists, tour operators, residents, NGOs, nonprofits, scientists, and financial organizations (One Planet, 2021; Roxas et al. 2020; Mason, 2003). The local and global scale of tourism activities and climate change necessitates collective action of these actors (Fritsche & Masson 2021). The collective “aggregation of individual actions,” contributed to the issues, but is also required for solutions (Hormio, 2023).

Inspiring individual behavior to contribute to and lead collective efforts can be challenging (Heberlein, 2012; Walker & Moscardo, 2014). Tourism, especially within nature-based settings and protected areas, is in a unique position to encourage and facilitate stakeholder adoption of pro-environmental behavior (Ardoin et al., 2015; Aseres & Sira, 2020; McNicol & Rettie, 2018; Wolf et al., 2019). Pro-environmental behaviors (PEB), or “those that one completes to consciously minimize their negative impact on the earth’s resources,” are a broad range of behaviors that encompass both public and private sphere actions (Kollmuss & Agyeman, 2002, pp. 240). There is a wide range of research on the variable responsibility and effectiveness of stakeholder engagement with conservation, especially as the result of nature-based tourism experiences. For instance, the research on tourists’ behavior looks quite different
than on residents or tour operators, due to their varying levels of involvement with a protected area (Brankov et al., 2022; Jamal & Smith, 2017; Lupp et al., 2016; Powell & Ham, 2008). Potentially, this specific type of stakeholder engagement, one where pro-environmental behavior is sparked by their experience within a protected area (Brankov et al., 2022; Jamal & Smith, 2017; Lupp et al., 2016; Powell & Ham, 2008), could constitute protected area ambassadorship, a new term that could be used to describe this phenomenon more globally.

Ambassadorship is commonly associated with representatives or diplomats sharing messaging or advocating on behalf of their own government in foreign countries (Merriam-Webster, n.d.a). However, the ambassadorship concept is also used fairly often in its reference to brand representation, either for a tourism destination or some other product (Andersson & Ekman, 2009; Uchinaka, 2019; Wassler et al., 2019). Additionally, the concept resembles similar terms such as stewards (responsible for care) or advocates (supporting a cause) (Bennett et al., 2018; Peçanha Enqvist et al., 2018; Reas et al., in review). The variety of uses and interchangeability of the term with stewardship and advocacy contributes to its usefulness in describing stakeholders who, on behalf of a protected area, engage in behavior that benefits collective climate action.

The term protected area ambassadorship, while new in its potential for generalizability across protected areas, has roots in a unique and climate-sensitive protected area. In Antarctica, the incorporation of ambassadorship into the experience began simultaneously with commercial tourism in the 1960s, and is still utilized by the International Association of Antarctica Tour Operators (IAATO) today (Alexander et al., 2019; IAATO, 2023a). The ambassador program focuses on visitor identification with and attachment to Antarctica as a catalyst for inspiring PEB (Smith, 2022). Antarctic Ambassadors, in their charter, are a “collaboration of people” who “love and respect the region, educate others by sharing their experiences, advocate for Antarctica, and protect the region by making positive changes at home” (IAATO, 2023a). The program is open to all “visitors to the region,” with a few groups, “school students, polar scientists, field staff, tourists, tourism workers, and youth groups,” directly highlighted on the webpage and the “Ambassadorship World Map” application (IAATO, 2023a).

Visitation to Antarctica is quickly rebounding after COVID-19 restrictions; topping over 100,000 visitors for the first time in the 2022-2023 season (IAATO, 2023b). Back in 1991, after increases in operators and visitors alike, seven tour operators created a centralized organization to manage tourism to the region (IAATO) (Verbitsky, 2013). Despite the overall regulation of
Antarctic activities facilitated by the Antarctic Treaty on behalf of the non-sovereign Antarctic Treaty Consultative Parties, tourism is for the most part regulated by the International Association of Antarctic Tour Operators (IAATO) (Verbitsky, 2013). As concerns grow surrounding the negative impacts of tourism on the Antarctic environment in the form of maritime pollution, wildlife disturbance, and introduction of invasive species, and climate change, among others (Liggett et al., 2017; Snyder, 2007), Ambassadorship offers a potential solution. Despite its potential, the focus in the scientific literature has almost exclusively been on analyzing the effectiveness of the Ambassadorship program on tourist behavior (Eijgelaar et al., 2010; Powell et al., 2008a). Likely due to the size of that stakeholder group compared to others and curiosity around the claim that “responsible travel can create Antarctic Ambassadors” (IAATO, 2023a). Yet there is uncertainty in the literature around the efficacy and validity of claims about creating lasting change in tourist behavior. This focus on tourists may reflect the uniqueness of the Antarctic tourism experience as it relates to stakeholders typically involved in tourism. Unlike most other tourist destinations, there are no historical or current indigenous or permanent communities in Antarctica; instead, there is a revolving door of scientists, tourists, operators, and guides that make a temporary home of the continent and whose ambassadorship may be overlooked.

Tour guides, for instance, are Antarctic tourism stakeholders with the potential to enact cohesive collective behaviors, and directly influence other stakeholders towards pro-environmental behavior. The responsibilities of guides are inseparable from the conservation and sustainability of a place, especially in nature-based tourism settings. The important influence of guides on visitor experience is well-documented in a variety of ways, and support for their collective influence on sustainable behavior and the sustainability of the industry is growing (Huang & Weiler, 2010). Tour guides are often described in the literature as “mentors and pathfinders” (Cohen, 1985), “as culture-brokers and mediators” (Ap & Wong, 2001), and as “interpreters, storytellers, intercultural communicators” (Chen et al., 2018, p. 60). The educational and interpretive duties that guides fulfill for tourists’ have potentially positive influences on PEB outcomes (Weiler & Walker, 2014; Zelezny, 1999). Nature-based and adventure guides have the additional responsibilities of managing risks and environmental impacts (Carnicelli-Filho, 2013; Weiler & Davis, 1993). In remote and wild places such as Antarctica, guides grant access to otherwise inaccessible landscapes or activities (Bachmann-
Vargas et al., 2022; Cohen, 1985). While nature-based guides facilitate both the safety and learning of visitors, they must also mitigate their impact on the environment. However, there is little exploration into how aspects and expectations of the guiding profession impact or influence guide’s own ambassadorship behavior.

Although tour guides serve a prominent role in Antarctic tourism, their influence as potential Antarctic Ambassadors has not been adequately explored. An enhanced understanding of tour guiding’s conceptual overlap with ambassadorship could result in increased recognition of the role guides play in influencing tourists’ behavior, and environmental conservation globally. This study aimed to explore the definitions and dimensions of protected area ambassadorship through the lens of polar tour guiding. Our first objective was to identify the conceptual alignment and potential dimensions of tour guiding and protected area ambassadorship through a literature review. The output from this first step was a Protected Area Ambassadorship Model. Our second objective was to test and refine this model using qualitative data from semi-structured interviews with polar tour guides. The following literature review explores conceptual overlaps identified between the tour guiding and ambassadorship literature, setting the stage for our conceptual model.

**Literature review**

To better understand Antarctic tour guide’s (or really any tour guide’s) capacity to serve as protected area ambassadors, we explored four key dimensions that were prevalent through the literature: place attachment, capacity, duty/responsibility, and community. The following subsections explain the concepts individually, as well as conceptual overlap from both the ambassadorship and tour guiding literature.
Table 3.1 Conceptual overlaps of tour guiding and ambassadorship literature in four main dimensions.

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Ambassadorship</th>
<th>Tour Guiding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Place attachment</td>
<td>Emotional or subjective bonds people have for a specific place; identity, dependence</td>
<td>Guides have extensive place-based knowledge; form connection while living/working there</td>
</tr>
<tr>
<td>Community</td>
<td>Unified body of individuals, that can share common interests, proximity, history, or culture; virtual or real</td>
<td>Formal and informal organizations and support systems, virtual and in-person, mentorship</td>
</tr>
<tr>
<td>Capacity</td>
<td>An individual’s mental or physical ability, otherwise known as skill or aptitude</td>
<td>Their capabilities and competencies can influence visitor learning and satisfaction; important in risky situations</td>
</tr>
<tr>
<td>Duty/Responsibility</td>
<td>Specific or recurring duties; obligations; moral duty; recognition/compensation</td>
<td>Job duties include managing risk, resource, visitor education, time, emotions</td>
</tr>
</tbody>
</table>

**Place**

Sense of place is the “emotional or subjective bonds people have for a specific place” (Nicolosi & Corbett, 2018, p. 78). Individuals may identify with a place in all or one of three main dimensions: attachment, dependence, or identity (Tapsuwan et al., 2011). Place attachment (PA) refers to the emotional bonds formed to a place, place dependence is about the reliance on a location to fulfill certain needs, and place identity is when belonging to the place becomes part of one’s self (Brehm, 2013; Budruk et al., 2008; Stedman, 2002; Nicolosi & Corbett, 2018). There are multiple ways place attachment can develop, and time is generally assumed to be an important mediator (Dwyer et al., 2019). The sense of place concept, and place attachment more specifically, are heavily studied due to empirical evidence linked to increased PEBs (Halpenny, 2010; Wilkins & de Urioste-Stone, 2018; Stedman, 2002; Vila et al., 2016), as well as more specific actions related to climate engagement (Nicolosi & Corbett, 2018).

Place attachment may play a fundamental role in ambassadorship. Strong place attachment has been shown to increase pro-environmental behavior, which is an expected outcome of ambassadorship (IAATO, 2023; Stedman, 2002; Larson et al., 2018; Wilkins & de Urioste-Stone, 2018). Ambassadors should have sufficient connection with the place that they have some knowledge of it, “love and respect it” “advocate for it” and “protect it” (IAATO,
The ambassador terminology is commonly used to tie a person’s role as an advocate or promoter to a specific place. Place ambassadors are tourists that promote a destination they recently traveled to because they enjoyed the trip and want to share that experience with others (Chancellor et al., 2021). Destination and citizen brand ambassadors, on the other hand, are local residents that feel connected to their home enough to promote its brand or image to potential visitors (Chancellor et al., 2021). Although terminology may be different, the underlying assumptions of place attachment as a motivation are similar. Antarctic tourists’ place attachment can be strengthened through the experiences had while on a trip, especially if the experience can create or increase positive emotional bonds with a destination (Brehm, 2013; Manzo 2005; Lin & Lee, 2019). Educational and interpretive experiences, key elements of polar cruises, are effective at facilitating visitor behavior change and emotional connection (Ham & Krumpe, 1996; Pooley & O’Connor, 2000). One study found that total minutes educated on a polar bear viewing excursion could predict the chance that visitors would report PEB intentions (Miller et al., 2020). The same study also found that emotional epiphanies were directly linked to PEB, and one third of visitors experienced one (Miller et al., 2020).

A tour guide’s role as an educator is dependent on their own knowledge and connection to the place (Pond, 1993 as cited in Christie & Mason, 2003). Visitors expect guides to have extensive place-based knowledge, especially in adventure settings where they are responsible for visitor safety while navigating terrain. A visitor in one study noted the decision to book a guided tour came from the desire to “learn skills, dress-code, and language within a subculture;” it was assumed the guide possessed this knowledge and was able to share it (Rokenes et al., 2015). Visitors could be dissatisfied if guides are lacking in their place-based knowledge (Ap & Wong, 2001), and decline in visitor satisfaction also has an impact on visitor’s likelihood of engaging in sustainable behavior (Alazaizeh et al., 2019). A guide’s role in helping visitors form their own connection to the place is emotionally laborious, for it requires some degree of emotional transmission or co-creation of affinity for a place and culture (Beedie, 2003; Buzova et al., 2022; Weiler & Black, 2015). But for many guides – especially those who rely on a place for their livelihood and income (Bachmann-Vargas et al., 2022; Cotner et al., 2017) – that work comes naturally. For example, the boteros working at the Marble Caves in Patagonia guide because tours offer a way to protect their natural and cultural heritage for future generations (Bachmann-Vargas et al., 2022). In nature-based settings, guides function as resource managers and role
models of environmentally responsible behavior. Place attachment may be a dominant factor in motivating that behavior, as guides must protect the place they love if they hope to continue guiding there (Serenari et al., 2012).

**Community**

A community is a “unified body of individuals” that share common interests, proximity, history, or culture (Merriam-Webster, n.d.f). Communities are no longer solely limited to in-person interaction, as virtual or online communities are popular features of social media (Andreatos, 2007; Edwards et al., 2017). Within communities, social norms have been found to be significant predictors of PEB across different cultures and contexts, especially among communities with dense networks and strong collective norms (Hwang et al., 2016). Social norms theory builds upon individual ethics and values to try and explain the attitude-behavior gap that is often seen when trying to measure PEB (Culiberg & Elgaied-Gambier, 2015). Both descriptive and injunctive social norms can influence the likelihood of an individual’s PEB due to a desire for belonging within the group, and they are unique to different social groups and cultures (Culiberg & Elgaied-Gambier, 2015). One study found higher community attachment, connectedness, and self-identification positively influenced PEB, likely due to a desire to protect a place and due to the influence of social norms around others’ civic behaviors (Smith et al., 2021).

Although not explicit in duties or responsibilities of an ambassador, the support of a community is invaluable in how effective individuals are at enacting behavior. There are many barriers to engaging in PEB, and one of the most important leverage points is social capital. Social capital allows individuals to utilize their networks in order to bypass structural limitations and work towards collective action (Bennett et al., 2018; Hwang et al., 2016). Additionally, public and activist behaviors can be more difficult to complete because they are out of the locus of control; yet, with a supportive community they may be more achievable (Heimlich & Ardoin, 2008). Therefore, a visitors’ home community and social norms will be important in how likely they are to enact these behaviors central to ambassadorship. For example, it may be possible that virtual spaces provide places for everyone, not only past visitors, to gather and share information (i.e., Facebook groups, etc.) provide community support and norm creation for people to engage in PEBs.
The social functioning of the tour guiding profession may be categorized as a community of practice. A community of practice can be centered around a passion for a profession, and because of regular interactions, facilitates the collective learning of members that share competencies, accountability, routines, tools, stories, and identity (de Paiva Duarte, 2013). Guides can join formalized communities of practice, or professional organizations, such as the World Federation of Tourist Guide Associations (WFTGA) (Ghahramani et al., 2018), or more region-specific groups, like the Polar Tour Guide Association (Charles, 2023). In guiding, alliances or internal partnerships form naturally to enhance knowledge sharing in situations where formal training is lacking (Bachmann-Vargas et al., 2022). Some tour operators even promote this informal training by requiring new guides to accompany more experienced ones before guiding alone, recognizing the power of the community for knowledge transfer (Carmody, 2013). Mutual accountability proves to be a motivator for PEB. In another study, a tour guide said, “you don’t want to be the one that blows it for everyone else” (Rokenes et al., 2015, pp. 76). Guides in this study were also motivated to protect the landscape due to fear of losing permits or permissions, which implies there is some concern for the greater community utilizing that land (Rokenes et al., 2015). An individual guide may be responsible for one group, but the collective effort of the whole operation is necessary for “shaping experiences, ensuring safety, and minimizing environmental impact” (Bachmann-Vargas et al., 2022, p. 2). A supportive community can positively impact an individual guide’s self-efficacy, or their perceived ability to model and encourage conservation behaviors, as well manage challenging situations, and ask for help (Crant, 2000; Guan & Huan, 2019). Central communication networks and professional associations are key to building community within, and may be critical for ambassadorship, within the tour guiding network (Ghahramani et al., 2018).

Capacity

Capacity, in its most basic form, refers to “an individual’s mental or physical ability,” otherwise known as skill or aptitude (“Merriam-Webster,” n.d.c). This definition can be expanded in regards to a person’s capacity for stewardship. Bennett et al., (2018) centered capacity as a main element of stewardship action, next to motivation and actors. They emphasized that capacity is mediated by assets (i.e., social, cultural, financial, physical, human, and institutional capital) and governance (institutions, laws, organizations, inequality, decision-
making) and should not be assumed as a baseline for everyone. These assets and governance factors are unique to each community and region in which a potential steward resides, and some may present real barriers to action even if the actor(s) is/are motivated.

The concept of ambassadorship seems to make the flawed assumption that motivation and capacity are consistently linked, the very assumption that Bennett et al., (2018) cautioned against. Ambassadors are expected to continue practicing and promoting stewardship behaviors independently, in their home environment, generally without clear guidance. Stewardship or general pro-environmental behaviors entail a great deal of actions spanning both public and private sphere behaviors (ex: planting trees, recycling, alternative transportation, limiting plastic use, eating less meat, voting, educating, gardening); the variety of options may not provide enough direction for new ambassadors to know where to start (Bennett et al., 2018; Stern, 2000). Such collective actions require the actor to have explicit knowledge of how to keep their commitment to ambassadorship, plus enough motivation, agency, and social-ecological support to do so (Bennett et al., 2018). Such capacity-building is expected to be achieved through the educational or interpretative experiences on an expedition. However, as previous research notes, there is typically a gap between this expectation and reality, with education often failing to achieve its aspirational goals (Powell et al, 2008a; Manley et al., 2017).

Tour guides are expected to possess many capacities, often discussed as competencies, ranging from navigation to leadership to risk management and mentoring (Løvoll & Einang (2021). Many factors influence a guide’s ability to have a positive impact on visitors, such as a guides’ emotional intelligence, communication competency, and humor (Black et al., 2018; Buzova et al., 2022; Christie & Mason, 2003; Jahwari et al., 2016; Tu et al., 2020; Weiler & Kim, 2011). Cohen (1985) discussed the potential link between guide competency and visitor satisfaction, and this link is still explored in research (Alazaizeh et al., 2019; Baral et al., 2012; Randall & Rollins, 2009). In addition to exceptional communication skills (Jahwari et al., 2016), guides are expected to manage group conflicts and build morale among groups with diverse backgrounds and cultural norms (Rokenes et al., 2015). The capacity of a nature-based guide must be even higher as they are required to monitor group safety through situations with added risks, especially in polar regions where their ability to navigate and make decisions that can result in injury or death (Andersen & Rolland, 2018; Løvoll & Einang, 2021). In the Arctic for example, remote expeditions require guides to be competent enough to navigate tricky routes,
filled with “polar bears, glacier crevasses, heavy storms, and breaking sea ice” (Andersen & Rolland, 2018, p. 363). In adventure tourism, the ability to manage group emotions, especially around fear, becomes an important skill (Carnicelli-Filho, 2013). In these scenarios, the guide needs to make quick decisions, often alone, and self-confidence or self-efficacy is critical (Løvoll & Einang, 2021). Self-efficacy also plays a role in the development of environmental literacy and behavior, as one needs to feel empowered in their ability to both initiate and maintain behavior (Bandura, 1977; Monroe, 2003). Competency can even be a barrier to guiding, as some operators require certifications or formal training as hiring requirements. Due to the varied responsibilities and required knowledge of guides, formal training is not always an option, especially in remote locations (Bachmann-Vargas et al., 2022). Research is also being conducted on the other aspects of a guide’s personality and competency that may actually impact the satisfaction and emotional connection of visitors (Ap & Wong, 2001; Jahwari et al., 2016; Tu et al., 2020). Collectively, tour guide’s capacity, conceptualized in multiple ways, might be a key pre-requisite for effective ambassadorship.

**Duty/Responsibility**

A basis for understanding responsibility and duty comes from the discipline of ethics, where moral, causal, and legal responsibilities represent different standards of conduct. Normative responsibilities hold some expectation for behavior, which can stem from general moral obligations or special familial or job-related duties (Hormio, 2023). Duties can be categorized in these two ways, and often are associated with special moral responsibilities, required either by work or a job (Hormio, 2023; Merriam-Webster, n.d.d). Causal responsibility focuses on the relationship between the actor and their role in causing something (Hormio, 2023). In general, causal responsibility plays an important role in understanding who is responsible for climate action, and reducing emissions (Hormio, 2023).

In the case of ambassadorship, there are a variety of influences on a person’s responsibility to engage in pro-environmental behavior, all depending on their role and relationship to the place. While they may possess a general moral or causal responsibility to prevent harm to the place or reduce emissions, the degree to which someone feels responsibility towards a place or object depends on their degree of awareness of potential negative consequences and the related value they ascribe to it (Confente & Scarpi, 2021). In the case of
tourism, factors that contribute to this are potentially affective connections to that place (Halpenny, 2010; Larson et al., 2015; Stern, 2000). Emotional connections are facilitated, oftentimes, by the educational experience’s tourists’ have on trips, and the effectiveness of those educators, typically tour guides (Miller et al., 2020). Feelings of responsibility, which are increased by awareness and environmental sensitivity, can influence behavior by activating personal norms related to the values, beliefs, and attitudes carried by the individual (Confente & Scarpi, 2021; Kim & Koo, 2020; Schwartz, 1977; Steg & Vlek, 2009). Theories vary on the values most effective at activating norms. For instance, the Norm Activation model focuses on altruistic or social collective-focused values (Schwartz, 1977), but the Value-Belief-Norm (VBN) theory acknowledges the range of values (Stern et al., 1999), including, egoistic and biospheric, that can activate personal norms (Kim & Woo, 2020; Stern, 2000). These values can align or conflict with hedonic (egoistic values) or normative motivations (biospheric or altruistic) and influence behavior further (Bennett et al., 2018; Heimlich & Ardoin, 2008; Larson et al., 2015; Lindenberg & Steg, 2007; Ryan & Deci, 2014; Steg & Vlek, 2009; Steg et al., 2014).

Modern guides have taken on an increasing swath of responsibilities and duties. Some visible and expected such as education, but others more nuanced and emotionally-taxing (Black & Weiler, 2005; Reisinger & Steiner, 2006; Tsaur et al., 2021; Tu et al., 2020). Guides are responsible for more than simply showing the guests around an area and telling them a story or fact. A critique of the original pathfinder and mentor roles is that it leaves out another key responsibility: guides must care for the natural resource itself. As Weiler and Davis (1993) clarified, a tour guides “resource management focus contains two roles: “motivator” (the modification of tourist behavior and impacts on-site) and “environmental interpreter” (the understanding and appreciation of environmental issues to facilitate responsible tourist behaviors in the long term)” (pp. 232). Beyond this, they are expected to also be “interpreter/educators, information givers, leaders, motivators of conservation values/role models, and cultural broker/mediator” (Black & Weiler, 2005, pp. 93). The factors influencing tour guide’s performance in these roles relies on a nuanced balance of personality, likeability, knowledge, comfort, support, and stress (Tsaur et al., 2021). The stress they feel can stem from role conflict, where duties associated with one role are in conflict with another; this can be due to personal life responsibilities at odds with a long season away from home, managing difficult guests on a tour while maintaining appropriate emotions, or other various “hassles” (Karatepe et al., 2006; Lin,
In nature-based or adventure settings, guides must balance the demands of both the visitor and the resource. Visitors rely on guides to manage risks and lead the group to safety (Lovoll & Einang, 2021), but they must manage this responsibility while also fulfilling their role as a natural resource manager (Randall & Rollins, 2009). There is little research exploring the motivation or factors influencing a guide’s commitment to these various duties.

Based on the literature, these four key dimensions: place attachment, capacity, duty/responsibility, and community, interact to motivate the behavior of ambassadors and tour guides. The effectiveness of an ambassador likely relies on the person possessing strength in these dimensions, but without empirical evidence that cannot be said for certain. The next section of this study aims to collect data that can validate the findings from the literature and our development of a conceptual model.

**Methods**

*Study setting & sampling*

We applied the conceptual model for protected area ambassadorship to Antarctic tourism using empirical data collected from tour guides through semi-structured interviews. The two-step methodology we adopted is common in research exploring the antecedents of PEB (Akhshik et al., 2021; Bennett et al., 2018; Confente & Scarpi, 2021; Esfandiar & Dowling, 2019; Kim & Koo, 2020). Qualitative methods are preferred for exploratory research because semi-structured interviews allow for deeper insight into participants’ subjective feelings and experiences while providing the researcher with enough structure to collect comparable data (Ap & Wong, 2001; Mason et al., 2010; Rahman, 2016).

We conducted semi-structured interviews August-October 2022 before the Antarctic tourism season started in November. Recruitment began in June 2022 through the Polar Tour Guide Association (PTGA), a “non-profit professional industry association that provides internationally-recognized certification and professional development for polar guides and field staff” (Charles, 2023). Due to the research teams’ connections through the Scientific Committee on Antarctic Research (SCAR), we were able to use a snowball sampling method to contact with guides through the PTGA organization and delimit participation to guides involved in that organization. We assumed participation in a tour guiding organization would increase the
likelihood that guides had a connection to the place and profession. We aimed to interview a combination of new (less than 5 years’ experience) and experienced guides (more than 5 years’ experience) to represent the wide range of guides operating in Antarctica. Many Antarctic tour guides additionally guide in the Arctic regions during the off-season, and we hypothesized that the ambassadorship behaviors they displayed in the Antarctic would be transferable to the Arctic regions. The focus on polar tour guides, rather than only Antarctic tour guides, in this study was due to the realization that the majority of guides work in both regions frequently.

Interview questions were developed around four themes corresponding to the dimensions identified in the initial conceptual model (Figure 3.1). Participants were asked to describe their involvement with their professional community, their perceived ability and skills as guides, how that has changed over time, and factors that contributed to their capacity-building. Participants were asked to describe which parts of their responsibilities were most important in the protection of Antarctica, and to what extent they felt that duty.

We achieved data saturation at 15 interviews, when no new concepts emerged, and themes were repeated consistently (Saunders et al., 2018). Interviews lasted an average of 35 minutes and were conducted and recorded on Zoom with the participants’ consent. Almost 9 hours (525 minutes) of video and audio data was collected and transcribed. Researcher reflexivity is also a critical component of collecting and interpreting qualitative data (Rose & Johnson, 2020). The first author had never traveled to Antarctica or been a tour guide, but has an interest in, and studies education/interpretation and visitor use management used in protected areas. Co-authors have more direct experience with Antarctic tourism research.

Data analysis

Interviews were imported into NVivo, a qualitative analysis software commonly used by researchers to code and sort interview data. We coded data deductively using a thematic analysis framework. A mixture of thematic and deductive techniques were appropriate in this data analysis, as they allowed researchers to start with pre-existing concepts to guide the coding process and flexibility within the process for themes to emerge (Given, 2012; Nowell et al., 2017). Thematic analysis follows a 6-step approach of initial coding to defining themes, but emphasizes the importance of an iterative and flexible process while coding (Nowell et al., 2017). We created a codebook before coding began based on the protected area ambassadorship
conceptual model conceptual framework that researchers used to structure the interview questions. A well-documented research plan, prolonged engagement with the data, member checks of the codebook and emerging themes, and referential adequacy were utilized to ensure credibility and dependability of the qualitative responses (Decrop, 2004). The use of an audit trail ensures transferability and confirmability of the findings. Interviews were conducted with IRB approval under Protocol #25172.

Results

Participants

A total of 15 Antarctic tour guides were interviewed for this study, 7 of which had less than 5 years of experience, and 8 of whom had worked as guides for 5+ years. Experience level was determined based on the year guides indicated that they began guiding in Antarctica. We did not collect explicit demographic information, but participants were predominantly White; we interviewed 7 males and 8 females, and all participants were between the ages of 27 and 69. Eight nationalities were represented, including: American, Argentinian, Australian, British, Canadian, Chilean, and Norwegian. All interviews were conducted in English.

Dimensions of Ambassadorship

Qualitative results focus on the four themes in our conceptual model (place, capacity, community, and duty/responsibility), and these were substantiated by the participant responses, along with 13 additional sub-themes that emerged. The sub-themes provide new information about the complexity and interconnectedness of the dimensions and the levels of depth in each focal dimension.

Place

Place – and place attachment more specifically – was reinforced as a major dimension of ambassadorship. Four emergent sub-themes – changes (either change to physical or social landscape over time), childhood influence (guides learned about Antarctica during childhood), stewardship (guides mention ideas about stewarding the landscape), and wilderness (guides discuss the pristine continent or wild nature) – helped to explain the dimension of place attachment (Table 3.1). Themes were similar between new and more experienced guides.
attachment appears to play a significant role in personal motivation to guide in Antarctica, with many expressing what they love about Antarctica. Guides specifically mention the natural landscape as main reason why the continent is special; however, guides who mentioned learning about Antarctica in childhood noted the social and historical legacies of the land tied to their home countries. Many participants explained how a personal connection to and a passion for Antarctica were motivating factors for their stewardship behavior. These forces, reinforced by time spent on the continent, were likely to inspire them to continue guiding in the region.

“Regardless of why they came into the industry. I think they stay because they love the place.” (I2)

“I knew it was a land of ice and rock and and wildlife, But when you actually go there, and you see, what was the most fascinating was to see how impressive the mountains are! The mountain range, and how close to the water it is So you don’t have to be very far inland to be blown away by the beauty of the scenery. And it’s uh you just feel like you know, you feel small. You feel vulnerable. You feel uh insignificant” (I5)

“From the very first moment I felt completely blessed to be able to be there, and to see the wildlife and the way you see it there. So pristine, and the fact that you're seeing the wildlife in a way they don't feel threatened by you, and I think that that's the best part, like the fact that the penguins will walk towards you if you stand there long enough, because they don't know what you are, and they they are not afraid of you. That experience is amazing.” (E8)

Table 3.2 Themes and sub-themes for place attachment dimension of protected area ambassadorship

<table>
<thead>
<tr>
<th>Theme</th>
<th>Subthemes</th>
<th>Sample Quote</th>
</tr>
</thead>
<tbody>
<tr>
<td>Place Attachment Changes</td>
<td>“I lived there through the whole seasons, and saw all the animals change. And so why? Because I lived there and connected through it. It's my second home.” (E3)</td>
<td></td>
</tr>
</tbody>
</table>
Table 3.2 (cont.).

<table>
<thead>
<tr>
<th>Childhood Influence</th>
<th>“And then one of my earliest memories 1950s Commonwealth Transatlantic expedition, when civilian forces went with Hillary the folks cross the continent, Hillary support, and so on. That's one of my earliest memories. So, I was inculcated with the idea of the Antarctic from an early age and that's how I came to hear about the British Antarctic survey.” (E2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stewardship</td>
<td>“So, for me it's super important to I think that's my largest active stewardship is to facilitate emotional connections from people to the environment, right, whether that be Antarctic or the reef wherever and if they have that emotional connection.” (E7)</td>
</tr>
<tr>
<td>Wilderness</td>
<td>“That there's something about the place that that feels very good and very wild pristine.” (I3)</td>
</tr>
</tbody>
</table>

Community

When asked to describe the professional community, two influential components emerged: mentoring (influence and support of fellow guides and professional organizations) and social media (communication channels and a community connection) (Table 3.4). The remoteness of guiding in the polar regions forces guides to rely on each other more strongly, and those bonds become important to their continued guiding, stewardship, and overall happiness in their roles. The community environment on the ship also influences the effective functioning of the team. With strong trust and mutual respect, the team functions as more of a “family-like” unit, which can create both positive and negative experiences. Strong community bonds are also important for guides perceived self-efficacy of stewardship behavior.

“I think a stronger guide community would help us do our jobs better, not just in terms of guiding but in terms of teaching and passing on knowledge” (I6).
‘It's a huge family, and like in every other family. Maybe you 'don’t have a really good relation with all of them but definitely with most of them you have a close relation, and with some of them you turn into family,” (E1)

“If everyone has this shared vision, th’n it's easier to execute that vision right, where’s it’s it's hard to feel like, you know, i’ you're like the one guy who cares a lot, you know, for, lik’ you're the guy all of a sudden you become the like, the Bio Security Police, which is not what you want, you want everyone to like share in that right? And yo’ don't want to be the one perso’ who's like talking about hard subjects, you know, with guests like. Maybe you got some climate deniers on board, or you got people that are like Well, you know, like, wh’ can't we hunt whales or something? Th’n it's easy to have those conversations, if you feel supported, and if you know that everyone in the area has that general same vision? Right? Yo’ don't want to be the like crazy man” (E7)

The diversity of experience within the tour guiding community is valuable to the continued learning of newer guides and reinforcement of community bonds, often through mentoring. Guides viewed mentorship as important for learning how to manage situations in the field or enhance their guiding skills. The risky environment of Antarctica creates opportunities for strong mentorship and enhanced community bonds.

“You were dealing with dangerous situations, often you were dealing with an incredibly, moving experience, you know, seeing polar bears on the ice, hunting, you know all the interactions with wildlife, with nature, all of these things were something that was or is still is something that is, that is a very, very big that has a massive impact and experiencing those things together put people very close together very quickly” (E6)

“I'm looking up to the older guides, you know, to for inspiration, but to kind of reassure me that i'm doing the right thing, and i'm at the right place at the right time” (I5) because when they first begin, their “sphere of awareness” is lower (E4).
The communities that guides described included both on-ship guides and the broader guiding community maintained through social media or mutual friends. Both new and experienced guides indicated using social media like WhatsApp and Facebook to communicate with each other at home and at work. Social media helps mediate community bonds in the off-season or between guides on different tours. Facebook groups seem to connect a larger group of guides together and provide a space to stay engaged with the community during the off-season, which facilitates community and the potential for ambassadorship.

“There’s two Facebook groups that people are very active in the PTGA one, and the Expedition Boat People. And so, even though I obviously don’t know all two thousand people in all of the groups, it’s interesting to just hear people’s takes on it, because every there’s so many different companies, so many different kinds of trips, um and people post news and questions. And so you get a, if you just exist in a little bubble of “Oh, I know these one hundred people that I’ve worked with, it feels very insular, but it’s actually quite a large community” (I2)

<table>
<thead>
<tr>
<th>Theme</th>
<th>Subthemes</th>
<th>Sample Quote</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community</td>
<td>Mentoring</td>
<td>“There's always somebody else who has a different way of viewing things or a different way of doing things. And again, it’s all shareware. So, when you see somebody else doing something that’s a little bit better, or perhaps attacks something from an angle you haven’t thought to look at it at. Then absolutely. You want to take that on board and lessen your impact uh both uh to the environment and the wildlife.” (E4)</td>
</tr>
</tbody>
</table>
Social Media
“The whole polar community, I find very like accepting and inviting like. If anyone's ever got questions, or you know we've got a little Facebook group of people posting on it all the time. I'm not super like, I don't get into much. I don't answer questions or not, monitoring it all the time, but whenever I poke in. It's like it's always, it's always good stuff. People have disagreements and arguments on things, you know, like whale watching or the best gun to use on bears or whatever.” (E6)

Capacity
In our exploration of capacity-building factors among Antarctic tour guides, two factors emerged: certifications and trainings (guides mention courses, certifications that aid their abilities) and professional history (previous employment and experiences) (Table 3.2). Most guides emphasized how feeling competent and comfortable in the environment was a turning point for their confidence while guiding, due to the dual responsibility of educating and ensuring guest safety.

“So you're able to really tailor the guest experience a whole lot more when you're not worried about what's going on in the ten meter zone around your chosen craft, or whatever it might be. So you just have more capacity to absorb and provide a lot more information because you're not focused on the tiny little details that become second nature as time goes on. The more experience you have, the easier it is to broaden your sphere of awareness when you're out there.” (E4)

“It would be better over time like you. You have to what I try to do, anyway. I trying to figure out okay when I want to be who I want to be in ten month’s time, or next season, or two seasons ahead, and then you, you pick one little thing to improve, and then you improve on that, you know, and then you improve on the other.” (I3)
Guides often began guiding in Antarctica with previous transferable skills and training that added to their feelings of capacity. Guides come from a variety of backgrounds, military, outdoor leadership, mountaineers, skiers, wildlife guides, divers, sailors. Required training for polar guiding also aided their skill development, but experiential learning proves effective. Many of the guide’s professional backgrounds showed their aptitude for managing risk and adrenaline that is inherent when guiding in Antarctica. Collectively, these skills and experiences provided guides with the capacity needed to become effective ambassadors.

“It's a completely different thing when you actually have the experience, because the experience, I believe, actually engraves something in yourself that you are not forgetting, or when you kind of like, see that in advance. You are aware, because it triggers something in your brain that okay, I need to be aware of this so definitely. It has changed a lot from the very beginning until now, even though yeah, I have been dealing with groups of people in the mountains and guiding since a lot of years every year, and every season gives you new things that are improving in that performance.” (E8)

Table 3.4 Themes and sub-themes for capacity dimension of protected area ambassadorship

<table>
<thead>
<tr>
<th>Theme</th>
<th>Subtheme</th>
<th>Sample Quote</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity</td>
<td>Certifications and Trainings</td>
<td>“Well, I'm a senior PTGA guide and a provisional assessor from the PTGA, and then I am a polar paramedic trained by ITLS. I'm a zodiac trainer. I'm a mechanic.” (E1)</td>
</tr>
<tr>
<td>Professional History</td>
<td></td>
<td>“But before that, back in the 1970s, depends on what you call guiding, what I've been talking about currently is cruise ship guiding, but in the 1970s I've worked with British Antarctic Survey as what they called in those days a field general assistant um these days that would be known as a field guide.” (E2)</td>
</tr>
</tbody>
</table>
**Duty/Responsibility**

Sub-themes that emerged from questions about tour guide’s duty and responsibility reflected the complexity of emotion related to guiding in a highly sensitive environment. Components of perceived duty/responsibility were revealed through sub-themes: education (guides discuss their role as educators to guests), impact (guides mention the environmental impact of tourism activities and visiting), industry responsibility (guides discuss the role of the industry in protecting the environment), and safety (guides discuss the task of keeping guests and themselves safe) (Table 3.3).

Job duties and personal responsibility overlapped, but personal responsibility seemed to be a bigger motivator for PEB for some due to emotional attachment to place and the internal conflict felt about the environmental impact. “Conflicted responsibility,” is how one guide describes the internal conflict they wrestled with over the environmental impacts of tourism in the Antarctic. This is a common theme among new and experienced guides. The desire to act as stewards themselves and create stewards of guests, conflicts with the actual impact of tourism, but many guides justify their actions by noting that the educational benefits potentially balance out the impacts. Polar guides acknowledge their responsibility and influence to stick to IAATO guidelines and encourage sustainability and responsible behavior within their respective companies. One guide expressed the weight of their responsibility as part of the industry itself, and some guides even pushed the industry for more explicit integration of education and ambassadorship into sustainable tourism practices.

“So when you are down there you are not thinking about. Oh, IAATO is looking. It's like, No, no, no, I am looking. Yeah, I am IAATO” (E1).

“because i’m not oblivious to the fact that we have a massive personal carbon footprint to go and do what we enjoy doing.” (E4)

“I think it would be really interesting to see the industry move more towards like towards this idea of environmental education and conservation, and maybe even donations like being an ingrained part of the Antarctic experience.” (I1)
The duty to educate guests is extremely important to guides. The idea of creating ambassadors from the trips is mentioned consistently as a way to balance those environmental impacts, and many guides see their biggest duty to the continent as influencing others’ behavior. They have to do this delicately because visitors are paying to be there on vacation and often want to avoid uncomfortable, heavy topics. The majority of education seems to happen in the field when guides explain the why behind the rules. Guides attempted to reduce impacts and increase other people’s concern and PEB through education and appropriate modeling of their own behavior, no matter whether they are guiding in the Arctic or Antarctic. Some guides even pushed the industry for more explicit integration of education and ambassadorship into sustainable tourism practices.

“Oh, enormous! It's an enormous responsibility? Um! I think about it all the time, particularly when i'm on the ship, but also when i'm off the ship like, how can I better convey this? How can I make the knowledge not dry, but give people like an emotional sense or um a personal responsibility for Antarctica, for the polar regions for our planet.” (I6)

“I just started picking up garbage on the shore. Which it's a little bit sensitive, because you know, you're doing it in front of these locals in this community, and I didn't really expand upon outside of the area right where we are pulling up the uh the zodiac. I think a couple of the locals saw it, and you know what they came away with. It was that you know we wanted to leave this place better than we than we found it, you know, and I think it was a positive experience.”(I7)

Table 3.5 Themes and sub-themes for duty/responsibility dimension of protected area ambassadorship

<table>
<thead>
<tr>
<th>Theme</th>
<th>Subthemes</th>
<th>Sample Quote</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duty/Responsibility</td>
<td>Education</td>
<td>Impact</td>
</tr>
<tr>
<td>---------------------</td>
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<td>--------</td>
</tr>
<tr>
<td><strong>Table 3.5 (cont.).</strong></td>
<td>“So, I think, educating myself and then educating others is key, especially those transitional concepts. Right? If you can teach someone something in Antarctic that applies to the rest of their life, then that's the tool they take with them, and then they won't forget, and they won't disconnect right?” (E7)</td>
<td>“The environmental impact of the kinds of trips that we guide, and where the value we add as environmental educators comes, and how that weighs against the environmental impact we have in this industry.” (I1)</td>
</tr>
</tbody>
</table>

**Discussion**

This paper sought to develop the first conceptual model of protected area ambassadorship and to evaluate the model with a case study of polar tour guides. Emergent themes in the
qualitative data analysis supported the four main dimensions of ambassadorship in our hypothesized model: place attachment, community, capacity, and duty/responsibility.

In Antarctic tourism, tour guides have not traditionally been the focus of the “Antarctic Ambassadorship” program, at least not as a topic of study in the published literature or in the bigger discussion amongst the industry. Yet tour guide roles are complex and important in the experience of visitors, as demonstrated in research conducted around the world (Alazaizeh et al., 2019; Baral et al., 2012; Jahwai et al., 2016; Randall & Rollins, 2009; Rokenes et al., 2015; Serenari et al., 2012), including the polar regions (Powell et al., 2016; Nielsen & Roldan, 2023). Guide’s responsibility for more than just visitor safety and education are apparent in the literature and validated by these interviews. Research often focuses on the outcomes for visitors that can form as a result of a guide’s emotional intelligence, capability, communication, knowledge, and leadership (Bajrami et al. 2020; Buzova et al., 2022; Einarsdóttir & Helgadóttir, 2022; Lovoll & Einang, 2021; Weiler & Walker, 2014), but rarely considers the influence those interactions may have on guide’s own pro-environmental behaviors, values, attitudes, beliefs, or emotions. This study shows that many guides Antarctica and the Arctic are embracing an ambassadorship role. Understanding more about how guides come to adopt this role may provide unique insights on the ambassadorship concept in sustainable tourism.

Our analysis resulted in a protected area ambassadorship conceptual model (Figure 3.1), that contained the four hypothesized dimensions, all of which remained dominant and consistent throughout data analysis. However, this enhanced model, developed through an iterative process with the research team, reflects more nuances in the protected area ambassadorship concept. This model depicts the non-linear, time-mediated process that individuals go through on their journey to ambassadorship. The four main dimensions are factors that change and flow over time, and the process is cyclical. There is some interaction between the dimensions, meaning strength in one could complement the other, or weakness in one would weaken the other. For example, the more time spent in a place, the more attachment that person has, which could strengthen the other dimensions (Nicolosi & Corbett, 2018; Smaldone et al., 2008; Wilkins & de Urioste-Stone, 2018).

The interconnectedness of the dimensions was also apparent in other ways. For instance, with respect to community and capacity, newer guides valued the mentorship that allowed them to develop their capabilities. These community bonds could not only strengthen the newer
guide’s capacity, but also the entire capacity, duty/responsibility, and place attachment of the entire guide community. Hehir et al. (2021) found that Social Identity theory can help explain that membership in a supportive community centered around a common goal can influence the development of a social identity within that group, and subsequently influence PEB (Tajfel & Turner, 1979). The identity formed in this community, through real and virtual interactions could reinforce the development of a guide’s environmentally focused values, beliefs, and norms that contribute to their ambassadorship. Strong community bonds can also be formed through a positive feedback loop with place attachment, as community attachment is formed and enhanced place attachment (Mihaylov & Perkins, 2014).

Further understanding the influence of the dimensions on behavior can be conceptualized as either internal or external constraints, with behavioral inputs or outputs. For instance, place and community might be considered factors external to the individual. While some aspects of place attachment and community can be internally constructed based on emotional connections, these are developed or strengthened through external factors that aid in the creation of these feelings (Mihaylov & Perkins, 2014). This is a place where the industry can work to promote environments and norms that support processes of social bonding and cohesion among teams (Mihaylov & Perkins, 2014). Capacity can be understood as internal based on concepts such as self-efficacy and related self-regulation, which are cognitive processes that influence behavior (Gist & Mitchell, 1992). These could be strengthened with intentional trainings or experiences. As duty and responsibility are effectively moral obligations related to an individual’s value system, these are highly individualized, internal cognitive processes that influence behavior (Hormio, 2023; Schwartz, 1977). On the other axes, capacity and community might be considered inputs. As strong community bonds and perceived ability to meet guiding goals are crucial to be an effective ambassador, these dimensions seem to function in a supporting role to the non-negotiable components of place attachment and a sense of duty or responsibility that must be present in an ambassador’s behavior.
Figure 3.1 Conceptual model of protected area ambassadorship. Introduces multi-level ambassadorship with advocates, stewards, ambassadors, champions. Dimensions include: place, community, capacity, duty/responsibility.

This model also illustrates a concept of multi-level ambassadorship, where a stakeholder could move between labels based on their strength in different dimensions. We differentiate the level of “ambassadorship” this way based on an assumption that people may not consistently enact behaviors to the same extent, at every point in time. As Bennett et al., (2018) discusses with environmental stewardship, “stewardship is also a fluid phenomenon that can change over time—as incentive structures, social norms, levels of dependence on resources, or access to resources and rights may change, individual actors or groups of actors may gain or lose the will and/or the ability to act as stewards” (p. 600). In each dimension, time seems to be an important mediating factor in the development of depth. For instance, stronger place attachment and place identity may need time to form (Larson et al., 2018; Smaldone et al., 2008); this makes sense considering the literature around resident place attachment (Chen & Dwyer, 2018). Time is needed to develop emotional bonds that can motivate behavior and feelings of responsibility, and
to form skills and abilities that increase feelings of self-efficacy that can contribute to capacity (Confente & Scarpi, 2021; Heimlich & Ardoin, 2008; Kim & Koo, 2020).

Additionally, it features a nested layout designed to represent the embedded nature of the levels. As shown on the model (Figure 3.1), there are four proposed levels of ambassadorship, “Antarctic Advocacy,” “Antarctic Stewardship,” “Antarctic Ambassadorship,” and “Antarctic Championship.” We consider that protected area ambassadors, at each level, could be characterized as change agents. Change agents are “actors that play a significant role in “initiating, managing or implementing change” (Lewis & Jurvale, 2010; Van Poeck et al., 2017, p. 32). The role of a change agent is also complex, with one person potentially fulfilling different roles than another change agent. Van Poeck et al., (2017) details four typologies of a change agent, “the Technician, the Convincer, the Mediator, and the Concerned Explorer” (p. 33). Convincers’ attempt to make change by shifting norms, values, and beliefs towards sustainability, they have a personal investment and this behavior is part of their identity. Mediators try to take a third-party role and facilitate the process of learning, the “concerned explorer” acts as a compromise of these two. Technicians are the planners and rely on facts to influence change (Van Poeck et al., 2017). It could be possible that each level of protected area ambassadorship is characterized by the type of change agent role most commonly performed by those groups, further distinguishing the levels. It is clear that polar tour guides fulfill different roles as ambassadors mediated by the dimensions outlined in the model. Such differences might be explained by factors like, time, personal and social norms, self-efficacy, and self-identity. Change agent typologies exist on a spectrum of personal involvement. More personally involved change agents, like the “Concerned Explorer” or “Convincer” have their own values, beliefs, and attitudes intertwined with the change they are promoting (Van Poeck et al., 2017). Similarly, in our model, a Champion or Ambassador would theoretically have values, attitudes, and behaviors matching the PEB they are promoting. Stewards or Advocates in our model are more akin to “Technicians” or “Mediators,” who are not as personally attached, but are more interested in seeing the outputs of learning or facilitating the education (Van Poeck et al., 2017).

At the highest level, champion is a common term used in the public and private sectors, often utilized within corporations or organizations to recognize individuals or a group that promotes change or supports a cause (Andersson & Bateman, 2000; Swaffield & Bell, 2012; Merriam-Webster, n.d.g). Champions function similarly to change agents that are often highly
visible individuals, such as celebrities, grassroots activists, and citizens (Swaffield & Bell, 2012). “Antarctic Champions” could be experienced tour guides (5+ years’ experience) and Antarctica community leaders, who could be upper management operators, tour leaders, diplomats, scientists, or tourists, with an influential platform and significant stakes and strong dimensions of ambassadorship in order to “champion” a cause. At the next level, “Antarctic Ambassadors” would potentially be slightly less experienced tour guides (less than 5 years’ experience), logistical staff, scientists, and some tourists. Where “champions” find success in their support of the cause from having especially strong dimensions of ambassadorship, this group may not have had the same time or resources to develop to that level yet.

The majority of the literature and conversation about ambassadorship in Antarctica currently focuses on what we would call “Antarctica Advocates,” or first time/one-time, visitors to the continent. Based on the four criteria of place, capacity, duty, and community, we would assume that “Antarctic Advocates” would not have enough time and resources to develop these dimensions thoroughly and therefore they would serve more as advocates than “ambassadors” or “champions.” Compared to tourists, tour guides, both experienced and inexperienced, are more likely to have the time and resources to develop in all four dimensions, to at least be considered “Antarctic Stewards,” a level indicating slightly stronger behavior than “advocates.” Differentiation between levels can be supported by guide’s reported behaviors.

A considerable difference between levels of ambassadorship is the willingness of an ambassador to challenge the “neoliberal ethical framework” that maintains “business as usual” practices by putting individual choice to engage above necessary collective change (Swaffield & Bell, 2012, p. 159). The difference between a steward and a champion, is that the champion possesses stronger capacity and responsibility to push for behavior change that goes beyond the individual. This is based on Swaffield & Bell (2012)’s analysis of corporate climate champions that were overall constrained in their ability to champion climate action, despite feeling a moral responsibility to do so, due to a socially-constructed, neoliberal boundary that they should only “encourage people to choose climate-friendly lifestyles,” (Swaffield & Bell, 2012, p. 258). The majority of guides identified this tension as they tried to enact ambassadorship, as evident in the duty/responsibility results. The emotional labor of guides is also most visible within this tension. As was discussed by multiple guides, the decision to return to the polar regions yearly despite the environmental impact is often driven by a belief that their commitment to influencing PEB of
guests could outweigh the negatives. The dissonance between the reality of the environmental impact of tourism and their desired outcome can cause some concern and stress before a trip and may result in increased emotional labor in interactions with guests as they try to facilitate those strong connections in a short amount of time.

Within this study, we were also interested in differences between ambassadorship practices among newer and more experienced guides. While newer guides may not have had the same amount of time guiding in Antarctica, they often come to guiding in the region from the Arctic or with some degree of place attachment (to polar regions) already present. The draw of “the White Continent” is seemingly, influenced by narratives and history surrounding it, which can affect a guide’s formation of place attachment even before arriving. Guides, and even tourists, are influenced by cultural narratives and histories related to Antarctica, many even mentioned its formation in childhood, depending on their nation of origin.

Cultural narratives about Antarctica are abundant, especially among British guides, as the history of the continent is tied up with imperialism and exploration. This idea is mirrored in the Arctic, where tour companies are promoting this “ability to transport the visitor back into certain kinds of history, nature, and tradition. Going North thus fulfills a set of expectations associated with a shedding of civilization, a simplification of needs, a testing of physical limits, and in some cases even a reckoning with deeper, more elemental psychic forces” (Kerber, 2022, 276). Guides in our study expressed these feelings – they felt the sense of danger, they sought out risk and enjoyed the adventure that accompanies a trip to Antarctica, and they explained how the history and mythology of the place only adds to the aura and mystique. For instance, Kerber discusses the narratives surrounding the northwest passage, and how exploration of the region became an expression of colonial exploration (Kerber, 2022, p. 275). Antarctica suffered a similar fate, with power grabs and claims of sovereignty from infamous explorers and the great powers in the world (Howkins, 2010; Martin, 2013). Stories of danger and risk created strong imagery about the place. Colonial narratives about Antarctica are not separate from this concept of ambassadorship, and they impact guide’s understanding of themselves in relation to Antarctica and their desire to be there.

There are many reasons to believe that our enhanced model of protected area ambassadorship could extend to other regions and contexts beyond Antarctica. Our results show potential for this broad applicability, as our study population of polar guides provided evidence
that dimensions transfer between the Arctic and Antarctic. Guides that work in both regions expressed the same sense of duty and responsibility that motivates their pro-environmental behavior, sometimes to an even greater extent due to the higher visibility of tourism impacts in the Arctic, like with littering and in interactions with indigenous communities. Due to the limitation with recruiting Antarctica-only guides, we expanded our study population, which allowed us to study the transferability of concepts between polar regions. Although, more research is needed to test the applicability of the model to other nature-based destinations, specifically non-polar regions. Additionally, the exploratory nature of this study, time-constraints for the project, and difficulty that exists with conducting observational or quantitative research at the study site, we were limited to collect qualitative data remotely. We would recommend future research testing the applicability of the model to consider collecting direct observational or quantitative data on behavior. Considering the wide range of behavior relevant to each dimension of the model, collecting this type of data may allow for a deeper understanding of the interactions at play. We would suggest further research to collect more data on these commonly measured drivers of pro-environmental behaviors, such as attitudes, values, and motivations to enhance the model even further with these psychological dimensions represented, for any stakeholder group. It would be interesting to see the mediating or predicting effect of motivations or personal values on tour guide behavior, as is commonly done with tourists (Cajiao et al., 2022).

Additional limitations to be mindful of include the potential social desirability bias that can sometimes happen in qualitative research (Hehir et al., 2021). Although qualitative interviews reached saturation, the results presented in this study are not generalizable across regions other than Antarctica and the Arctic. Even within the sample, the focus of guide experience was on Antarctic guiding, and although guides shared experiences from their time working in the Arctic, Antarctica was the location of interest. Participants also self-selected out of an already restricted sample from the Polar Tour Guiding Association, thus, cannot be representative of all polar tour guides. Despite majority of guides mentioning some challenges and difficulties with aspects of their role, we the researchers, did not explicitly ask for that information. The topic of emotional labor in tour guiding is an emerging research area, but an important one to consider in this context as increased psychological stress can have an impact on well-being and capacity (Houge Mackenzie & Kerr, 2013). The more emotional labor required of
tour guides, especially of nature-based or adventure guides due to the increased uncertainty and risk of situations, could potentially influence their ability and desire to act as ambassadors. Further research should consider explicitly studying the emotional labor performed by polar tour guides to better understand the pressures felt and interactions between emotional labor and ambassador capacity.

Tourism within protected areas dedicate significant effort to the education of visitors to improve their conservation behaviors (Powell & Ham, 2008b; Sim et al., 2018). This notion of “transformative tourism,” where the outcome of an experience is some sort of change, may be best facilitated by guides themselves (Christie & Mason, 2003, p.9). Considering the role of guides as ultimate frontline ambassadors, especially in nature-based tourism, efforts to move them from advocates to champions should be taken upon by the industry. Enhancing the capacity of guides through training, encouraging, and facilitating community bonds between guides, and increasing feelings of individual responsibility by valuing each guide’s unique relationship to the destination can all aid in developing ambassadorship. Effective guide ambassadorship has important implications for any tourism destination attempting to create change in their visitors.

Conclusion

Overall, the majority of guides could be classified as “Antarctic Ambassadors,” with a select few going above and beyond to challenge the standard approach to behavior change or inappropriate business practices. Guides, overwhelmingly, through their time guiding, have adopted values, beliefs, and attitudes that center the protection of Antarctica at the forefront of their interactions with guests. It is their personal investment, and the recognition of their own impact and responsibility to be change agents, that makes them ambassadors.

This study began the iterative process of expanding and defining a model of protected area ambassadorship that includes not just visitors, but tour guides who help shape experiences of place. This conceptual model could be applied across all protected areas and could be used to better understand the link between values and actions (i.e., PEB) among different stakeholder groups. The implications within polar, and specifically Antarctic tourism, are particularly important given the movement and energy towards assessing tour guiding’s role in the industry (Nielsen & Roldan, 2023). Antarctic and Arctic tour guides are already engaging in ambassadorship behavior, often without recognition or adequate resources to fully capitalize on
their influential roles. In Antarctica, the pressure is on to responsibly manage tourism; examining the potential importance of tour guides as ambassadors could provide guides with more agency in educational programming content and operations decision-making. This would not only help guides impact more tourists, potentially positioning them as advocates or stewards, but it might also enhance utilization of community networks to move more guides towards becoming ambassadors or champions. The hope for this conceptual model of ambassadorship is to influence increased conservation behavior in Antarctica and all protected areas, and encourage the development of more champions for conservation, both in nature-based areas, and at home.
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CHAPTER 4
CONCLUSION

Connection to nature is a great pathway for conservation behavior. Strong connections to the environment form most easily in childhood, when exposure to environmental education is more common. Experiences ranging from nature-based programs to ecotourism can help develop connection to nature by building emotional connections later in life. As the need for public engagement with conservation increases due to a changing climate, understanding what factors drive strong relationships to the environment across a wide variety of contexts and populations becomes increasingly important (IPCC, 2023). This thesis highlighted two very different cases addressing this need -- one with children in North Carolina, and one with tourism in Antarctica.

One key issue in understanding how to promote connection to nature is how to accurately measure it. Accurate measurement can make sure programs are as effective as possible. With measurement, language really matters. For instance, do we know whether “nature” means the same thing as “outdoors” or “outside?” to everyone? How does that impact our measurement of a connection to “nature?” There’s increasing conversation around how the language we’re using to promote and measure connection to nature may not be the most inclusive for racial and ethnic minorities and among different gender identities. This is due in part to histories of racial and ethnic discrimination tied to the environment.

Our study in North Carolina wanted to find out how elementary age children may perceive the terms “nature” and “outdoors” differently. Researchers gave elementary students one of two versions of a survey measuring connection and emotional responses to “nature” and “the outdoors.” In general, connection to nature did not significantly vary when measured with the term “the outdoors” compared to the term “nature” on a survey, even across different racial, ethnic, or gender identities. However, there were differences in the emotional connection that children associated with each term. In particular, for female-identifying students, the term “nature” prompted more feelings of calmness than excitement, and more comfort than nervousness, as compared to “the outdoors.” These findings suggest that though differences may be small and nuanced, children may react differently to experiences pitched as in “nature” versus “the outdoors.” More research is needed to ensure that programs are inclusive and inviting to all children.
In addition to generating inclusive language and associated measurements of connection to nature, another consideration is how to move people from experience to connection to action. For this question, we turn to a more southern and much more isolated setting. Antarctic tourism is an incredible case study in how nature-based experiences can potentially increase conservation behavior. The industry promotes a program called “Antarctic Ambassadorship,” that emphasizes how the powerful emotional and educational experiences people have in Antarctica can increase their connection to nature and advocacy for Antarctic conservation. This applies to all visitors to the continent, but for the most part, researchers have focused on tourists. This study sought to understand how this “ambassadorship” process happens and if it happens with other people who spend time in Antarctica.

In interviews with Antarctic tour guides, four main drivers of their “ambassadorship” behavior emerged: 1) capacity to enact environmentally-friendly behaviors, 2) support from their community, 3) attachment to Antarctica, and 3) feelings of responsibility to do something. These four factors represent a conceptual model of protected area ambassadorship that could be applicable across other protected areas, including across the polar regions. Practitioners might focus on these factors to encourage connection to nature and subsequent pro-environmental behaviors for a variety of populations.

Examining the influences affecting different populations’ formation of connection to nature, in both a local and global context, can improve current strategies and programs. These two respective studies should contribute to the growing body of knowledge around facilitating conservation behavior among different populations.
References


APPENDICES
### Appendix A

**Nature Connectedness Index Scale**

<table>
<thead>
<tr>
<th>Item</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>No Opinion</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I always find beauty in nature/the outdoors</td>
<td>![Rating Icon]</td>
<td>![Rating Icon]</td>
<td>![Rating Icon]</td>
<td>![Rating Icon]</td>
<td>![Rating Icon]</td>
</tr>
<tr>
<td>I always treat nature/the outdoors with respect</td>
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<tr>
<td>Being in nature/the outdoors makes me very happy</td>
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<td>![Rating Icon]</td>
<td>![Rating Icon]</td>
<td>![Rating Icon]</td>
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<td>![Rating Icon]</td>
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<td>![Rating Icon]</td>
<td>![Rating Icon]</td>
</tr>
<tr>
<td>I find being in nature/the outdoors really amazing</td>
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<td>![Rating Icon]</td>
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<td>I feel part of nature/the outdoors</td>
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</table>

*“Nature/Outdoors” Versions*
Appendix B

Outdoor / Nature Survey Consent

We are inviting you to take a short survey!
You do not have to be in this study. No one will be mad at you if you decide not to do it any time. If you decide to be in this study, we will not tell anyone else how you respond or act as part of the study, including the people who care for you or your teacher.
Everything that you share will remain private unless we think you are being hurt by someone else. If that happens, we will have to tell someone only enough information in order to help you be safe.
If you have any questions about this research but you don’t want to ask us, or if you feel you have been hurt from this research, you can contact Jennie Ofstein at irb-director@ncsu.edu or (919) 515-8754. She will be able to help you.
Saying "yes" below means that you have read this or have had it read to you and that you want to be in this study. Remember, you can stop being in this study, even after you say “yes.” Just stop or tell an adult you want to stop.
Do you agree to take this survey?
  o Yes, I agree (1)
  o No, I do not agree (2)

What is your teacher’s name?
________________________________________________________________________
Appendix C
Nature Survey (Version A)

Hi students!
We're excited to hear what you think about this topic! Please respond to the following questions.
There are no right or wrong answers.

When I think of nature, I think of...
________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________

When I think of nature, I feel:
o Really sad (1)
o Sad (2)
o In-between (3)
o Happy (4)
o Really happy (5)

When I think of nature, I feel:
o Really calm (1)
o Calm (2)
o In-between (3)
o Excited (4)
o Really excited (5)

When I think of nature, I feel:
o Really nervous (1)
o Nervous (2)
o In-between (3)
o Comfortable (4)
o Really comfortable (5)
Tell us if you agree with the following statements:

I always find beauty in nature
  o 👎👎 (1)
  o 👎 (2)
  o ?? (3)
  o 👍 (4)
  o 👍👍 (5)

I always treat nature with respect
  o 👎👎 (1)
  o 👎 (2)
  o ?? (3)
  o 👍 (4)
  o 👍👍 (5)

Being in nature makes me very happy
  o 👎👎 (1)
  o 👎 (2)
  o ?? (3)
  o 👍 (4)
  o 👍👍 (5)

Spending time in nature is very important to me
  o 👎👎 (1)
  o 👎 (2)
  o ?? (3)
  o 👍 (4)
  o 👍👍 (5)

I find being in nature really amazing
  o 👎👎 (1)
  o 👎 (2)
  o ?? (3)
  o 👍 (4)
  o 👍👍 (5)
I feel part of nature

- 👎👎 (1)
- 👎 (2)
- ❓ (3)
- 👍 (4)
- 👍👍 (5)

During a normal school week, about how many hours per day do you spend in nature?

- 0 (0)
- 1 (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 (5)
- 6 or more (6)

During a normal weekend, about how many hours per day do you spend in nature?

- 0 (0)
- 1 (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 (5)
- 6 or more (6)
Appendix D
Outdoors Survey (Version B)

Hi students!
We're excited to hear what you think about this topic! Please respond to the following questions.
There are no right or wrong answers.

When I think of the outdoors, I think of...

________________________________________________________________
________________________________________________________________
________________________________________________________________

When I think of the outdoors, I feel:
  o Really sad (1)
  o Sad (2)
  o In-between (3)
  o Happy (4)
  o Really happy (5)

When I think of the outdoors, I feel:
  o Really calm (5)
  o Calm (4)
  o In-between (3)
  o Excited (2)
  o Really excited (1)

When I think of the outdoors, I feel:
  o Really nervous (1)
  o Nervous (2)
  o In-between (3)
  o Comfortable (4)
  o Really comfortable (5)

Tell us if you agree with the following statements:
I always find beauty in the outdoors
  o 👎👎 (1)
  o 👎 (2)
  o ❓ (3)
  o 👍 (4)
  o 👍👍 (5)
I always treat the outdoors with respect
  o 👎👎 (1)
  o 👎 (2)
  o ❓ (3)
  o 👍 (4)
  o 👍👍 (5)
Being in the outdoors makes me very happy
  o 👎👎 (1)
  o 👎 (2)
  o ❓ (3)
  o 👍 (4)
  o 👍👍 (5)
Spending time in the outdoors is very important to me
  o 👎👎 (1)
  o 👎 (2)
  o ❓ (3)
  o 👍 (4)
  o 👍👍 (5)
I find being in the outdoors really amazing
  o 👎👎 (1)
  o 👎 (2)
  o ❓ (3)
  o 👍 (4)
  o 👍👍 (5)
I feel part of the outdoors
During a normal school week, about how many hours per day do you spend in the outdoors?
- 0 (0)
- 1 (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 (5)
- 6 or more (6)

During a normal weekend, about how many hours per day do you spend in the outdoors?
- 0 (0)
- 1 (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 (5)
- 6 or more (6)

How do you identify?
- Boy (0)
- Girl (1)
- Non-binary (2)
- In a way not listed here (3)
- I prefer not to answer (5)

What is your race or ethnicity? You can choose more than one.
- White or Caucasian (0)
- African-American (1)
- Hispanic (2)
Asian or Pacific Islander (3)
Native American (4)
Other: (5) ______________________________________

Which of the terms below do you feel most connected to?
- Nature (1)
- The outdoors (2)
- Not sure (3)

Which of the following places would you want to spend more time in?
- Nature (1)
- The outdoors (2)
- Not sure (3)
Appendix E

Nature Connectedness Index Descriptive

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>Factor Loadings</th>
<th>Cronbach’s Alpha</th>
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### Appendix F

**Emotion Scale Descriptive**

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Appendix G

Mean values of two version of nature connectedness index scores for whole sample and across gender and race

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Appendix H

Mean values of emotion associated with the word “nature” versus “the outdoors” for whole sample and across gender and race

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<th>Nature</th>
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<th>The Outdoors</th>
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<td>mean</td>
<td>sd</td>
<td>n</td>
<td>mean</td>
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<tr>
<td>Whole sample</td>
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# Appendix I

## Interview Protocol

<table>
<thead>
<tr>
<th>Brief Introductions (after consent process)</th>
<th>Demographics/Guiding Logistics</th>
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<tbody>
<tr>
<td></td>
<td>Remind them they are being recorded and ask if they consent, make sure they signed consent form. Remind them of the time, apologize for having to cut them off.</td>
</tr>
<tr>
<td></td>
<td>What is your age?</td>
</tr>
<tr>
<td></td>
<td>Where are you from?</td>
</tr>
<tr>
<td></td>
<td>When did you begin guiding?</td>
</tr>
<tr>
<td></td>
<td>Did you begin guiding in Antarctica/Polar region, or did you start/learn to guide elsewhere?</td>
</tr>
<tr>
<td></td>
<td>Do you plan to continue guiding in Antarctica?</td>
</tr>
<tr>
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<td>What companies?</td>
</tr>
<tr>
<td></td>
<td><strong>Capacity</strong></td>
</tr>
<tr>
<td></td>
<td>Do you have any certifications/ formal training? If so, where/what are they? (anything you feel is relevant to your skills)</td>
</tr>
<tr>
<td></td>
<td>How has your experience (guiding) changed your ability and skills in guiding?</td>
</tr>
<tr>
<td><strong>Community</strong></td>
<td>Do you feel that you are an effective steward for Antarctica based on your guiding actions? Why or why not?</td>
</tr>
<tr>
<td>--------------</td>
<td>---------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Community</strong></td>
<td>Describe your professional community(fellow tour guides) How involved are you with that community?</td>
</tr>
<tr>
<td></td>
<td>To what extent do you interact with fellow tour guides? How? For any specific purpose?</td>
</tr>
<tr>
<td></td>
<td>What aspects of this community are most important to you?</td>
</tr>
<tr>
<td></td>
<td>How does your relationship with the community change your stewardship of Antarctica?</td>
</tr>
<tr>
<td><strong>Responsibility</strong></td>
<td>What parts of your responsibility as a tour guide do you feel are most important in protecting Antarctica?</td>
</tr>
<tr>
<td></td>
<td>To what extent do you feel responsible for protecting the area where you are guiding?</td>
</tr>
<tr>
<td>Place</td>
<td>How connected do you feel with Antarctica? Why? What does Antarctica mean to you? (as a tour guide, as an individual)</td>
</tr>
</tbody>
</table>
Appendix J

Polar Tour Guide Recruitment Flyer

Let's Talk about Antarctic Tour Guiding!

Have you guided in Antarctica within the past 5 seasons (2016–2022)?

Are you more experienced?
5+ years

Are you newer to guiding?
Less than 5 years

We want you to participate in our research

With a 45-minute Zoom interview

To find out more: Fill out this form

Julianne Reas; jlmorrell@ncsu.edu