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EFFECTS OF A VOLUNTOURISM EXPERIENCE ON PERCEPTIONS AND ATTITUDES TOWARD ENVIRONMENTAL SUSTAINABILITY AND SCIENCE

A Thesis

Presented to

The Graduate Faculty

Central Washington University

In Partial Fulfillment

of the Requirements for the Degree

Master of Science

Primate Behavior

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by

Mireille Nicole Gonzalez

May 2019

CENTRAL WASHINGTON UNIVERSITY

Graduate Studies

We hereby approve the thesis of

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Candidate for the degree of Master of Science

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Dean of Graduate Studies

ABSTRACT

EFFECTS OF A VOLUNTOURISM EXPERIENCE ON PERCEPTIONS AND ATTITUDES TOWARD ENVIRONMENTAL SUSTAINABILITY AND SCIENCE

by

Mireille Nicole Gonzalez

May 2019

The current study explored the impact of a volunteer tourism experience at a community-based conservation (CBC) organization on volunteer perceptions, attitudes, and values toward conservation, the environment, and science. The Madagascar Research and Conservation Institute (MRCI) is a CBC organization that utilizes volunteers as a data collection resource and workforce for conservation and community outreach initiatives. The current study analyzed data from volunteer experience evaluations (VEE), which included pre- and post-experience self-report surveys comprised of qualitative and quantitative response sections, completed by 45 voluntourists over a three-month span. The quantitative findings indicate that the voluntourist experience improved participants' self-reported attitudes towards participating in sustainable practices but did not alter science attitudes. Overall, participants in programs with scientific training had more positive science attitudes and self-efficacy, suggesting that voluntourists may self-select into specific conservation programs due to their attitudes toward science. Qualitative responses mirrored the quantitative findings with voluntourists better able to describe ideas about sustainable lifestyle choices as well as displaying increased emphases on environmental awareness and

concern, individual commitment to using and wasting fewer resources each day, and a better understanding of the ways in which scientific research impacts conservation and environmental awareness after their experience. The current findings suggest that volunteers select their experiences at research- and conservation-related organizations, in part, due to their understanding of scientific research and that voluntourist experiences can improve attitudes toward sustainability and the environment.

ACKNOWLEDGMENTS

I would like to thank my advisor, Dr. Kara Gabriel, for her guidance and support throughout the research design and analysis process as well as for her editorial assistance. Thank you to my committee, Dr. Lori Sheeran and Dr. Hope Amason, for their time and expertise. I would also like to acknowledge the administrators and the volunteers from MRCI, without whom this would not have been possible. Thanks, too, to the Debra and Arlen Prentice Award for Primate Research for helping support my research. Lastly, thank you to my research assistants, Matthew Weber, Nicole Douglas, Emma Olson, Jodi Roush, and Bailey Hanes, for helping to transcribe and code my data.

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CHAPTER I

INTRODUCTION

During our age of consequences (White, 2015), conservation initiatives and academic approaches must adapt to an accelerated rate of environmental degradation and biodiversity loss. In response to the dissolution of biodiversity, we have seen the materialization of numerous new conservation and environmental organization designs. One design is the community-based conservation (CBC) organization in which administrators often link sustainable development with conservation goals and prioritize working with local community members (Brooks, Waylen, & Mulder, 2013). CBC organizations that operate as community-based tourism enterprises (CBTE), in that they host international volunteers for a length of time while these individuals contribute to organizational initiatives and programs (Mayaka, Croy, & Cox, 2019), align within the volunteer tourism sector (Wearing, 2001).

Volunteer tourism, commonly referred to as voluntourism, is a form of alternative tourism in which international tourists reside with a hosting organization and work in programs focused on community outreach, sustainable development, research, and conservation projects, in addition to interacting with local community members and participating in tourist activities (Wearing, 2001). Voluntourism opportunities have been pointed to as informal environmental education experiences (Ballantyne & Packer 2005), with the potential to influence voluntourists' attitudes, perceptions, and knowledge regarding environmental sustainability (Ballantyne, Packer, & Falk, 2011). However, investigations into the direct impact these experiences have on volunteer attitude transformation is relatively limited (Wearing & McGehee, 2013), and those who have

researched this phenomenon have generally employed post-experience qualitative methodologies, such as interviews, in order to understand voluntourist motivations or participant perceptions of their experience (Broad, 2003; Halpenny & Cassie, 2003; McIntosh & Zahra, 2007). As an informal education experience, programs that include data collection and research may also influence science attitudes, though prior research has found that altering science attitudes is difficult (Brossard, Lewenstein, & Bonney, 2005; Jordan, Gray, Howe, Brooks, & Ehrenfeld, 2011). Therefore, my primary objective in the current study was to investigate if a voluntourism experience at the CBC organization, Madagascar Research and Conservation Institute (MRCI), would lead to attitude transformations.

MRCI is a CBC organization located on Nosy Komba, a small island off the northwestern tip of Madagascar. MRCI administrators are interested in systematic habit data collection and have prioritized a wide array of conservation issues that plague the local biodiversity and people. Their initiatives range from community outreach, education training, sustainable resource management, and research on marine and terrestrial biota. Anywhere from 50 to 150 voluntourists can live and work at MRCI from June to September each year, with voluntourists typically staying between two to eight weeks. I developed the volunteer experience evaluation (VEE), which consisted of a pre- and a post-experience self-report survey comprised of quantitative and qualitative items, in order to measure voluntourist attitude transformations in regard to the environment, conservation, and science.

CHAPTER II

LITERATURE REVIEW

Community-Based Conservation Organizations

CBC organization administrators often implement and manage initiatives that link conservation with sustainable development and emphasize that conservation success requires working with and benefiting local communities (Berkes, 2004; Brooks, Franzen, Holmes, & Grote, 2006; Brooks et al., 2013). A variety of CBC projects and organizations exist, and initiatives range from sustainable resource development, protected area management, and conservation programs to education and community development programs (Dolins, Rasamimanana, Ratsimbazafy, Feistner, & Ravoavy, 2010; Ferrie et al., 2014; Garnett, Sayer, & Du Toit, 2007; Wearing, McDonald, & Ponting, 2005). The academic literature largely credits local community members, specialized conservation organizations (e.g., nonprofits and wildlife sanctuaries) and government agencies as the most ethical managers and trusted implementers of CBC initiatives (Brooks et al., 2013; Dolins et al., 2010; Ferrie et al., 2014; Mehta & Heinen, 2001; Wearing et al., 2005). The commonality among these different programs and institutions is that they prioritize and promote conservation approaches that "…seek[s] to accommodate local people's needs and aspirations by empowering them, promoting their active participation in local resource management, and improving their economic welfare" (Mehta & Heinen, 2001, p. 166).

Unfortunately, variations in conservation practices and initiatives in combination with deficiencies in accepted standards by which to gauge the efficacy of their activities have resulted in an academic debate on the success and conservation impact of CBC

organizations (Berkes, 2004; Brooks et al., 2013). Some think it impractical and ineffective to have biodiversity conservation and development goals in one project and further oppose programs that are administered and managed by citizen scientists or local peoples (Berkes, 2004, Gardner, 2009). The opposing side of the debate advocates that, with appropriate implementation, networking, funding, and management, these projects are achievable and can produce effective conservation initiatives (Berkes, 2004, Gardner, 2009). Some evidence indicates that CBC projects are capable of contributing to successful conservation initiatives, particularly by incorporating interdisciplinary and multi-level approaches (Berkes, 2004; Brooks et al., 2013). However, there has yet to be clear and consistent evidence of success, or even a consensus on what is considered successful, for these programs.

A number of variables have been identified that contribute to the failure of such programs (Brooks et al., 2013). For example, initiatives or organizations may fail due to overly optimistic goals, lack of regional knowledge, lack of financial sustainability, poorly designed projects, or lack of support from local peoples (Brooks et al., 2006; 2013; Garnett et al., 2007). Unfortunately, such difficulties or poor outcomes may be exacerbated by the lack of systematic measures of success and impact for individual initiatives. The dearth of publicly accessible project evaluations results in an inability to make broad assessments and comparisons among organizations. This may be due, in part, to the large range of different ideals and approaches among initiatives and the failure of organizations to consistently contribute to a published, accessible literature (Berkes, 2004; Brooks et al., 2006; 2013).

The issues presented in the academic literature indicate the need for well-designed projects and protocols that include systematic measurements for their evaluation. For example, creating an open-access network of project design models and evaluation resources may facilitate more successful CBC programs. Additionally, enhanced project outcome sharing might ensure that CBC organization members have the knowledge they need to implement cost effective projects, reliably invest scarce resources, ensure continued funding, and establish relations with local people and government (Baylis et al., 2016). In addition to systematic guidelines, it is imperative that individual initiatives are assessed by those with specialized knowledge of locals, academics, or government officials which can, then, be used to build an understanding of specific environmental and social nuances (Berkes, 2004). The most effective way to achieve success in this venture is to create an interdisciplinary and multi-level network of affiliates who can contribute perspectives, expertise, and skills (Baylis et al., 2016; Berkes, 2004; Brooks et al., 2013; Gardner, 2009; Garnett et al., 2007; Washington, Baillie, Waterman, & Milner-Gulland, 2014). Baylis et al. (2010) advocated for partnerships between scientists and CBC organizations in order to create more effective and holistic project designs, and Wearing and McGehee (2013) encouraged researchers to develop accurate measures of success for all types of community-based tourism enterprises (CBTE).

Voluntourism

Voluntourism is a form of alternative tourism in which vacationers choose a tourist experience facilitated by an organization where they will spend the majority of their vacation volunteering on projects related to conservation, scientific research, and community outreach and development (Wearing, 2001). The impact and ethics of

volunteer tourism, as well as ecotourism and wildlife tourism, are debated in the academic literature (Butcher & Smith, 2010, Guttentag, 2009; Wearing et al., 2005). Poorly implemented and managed wildlife tourism is linked to disturbance of wildlife populations, increased fragmentation of those populations, and unnaturally high or low population densities. Furthermore, tourists' desire for wildlife photo opportunities and direct interaction with animal populations can contribute to the illegal wildlife pet trade and increased habituation of wild populations (Hindinger, 1996; Orams, 2002). Cultural tourism has an equal potential for harm, including reinforced cultural dichotomies, indifference to local peoples' needs, rationalization of poverty, and economic disturbances (Guttentag, 2009). These issues are especially prevalent due to the increased commodification of the volunteer experience by private companies and to the occasionally uninformed decisions made by global tourists (Wearing et al., 2005).

Ecotourism and voluntourism are not inherently negative in their impacts and do not necessarily involve unethical choices. Many tourists who participate in voluntourism during their holidays claim to do so for altruistic reasons, with the desire to 'make a difference', or to help the locals or environment (Broad, 2003: Butcher & Smith, 2010; McIntosh & Zahra, 2007; Wearing et al., 2005). Voluntourists are depended on to work, to upkeep the site and, in many instances, to pay for the experience, making volunteers the primary contributors to project budgets (DC Team, 2016; Lovell, Hamer, Slotow, & Herbert, 2009; Mehta & Heinen, 2001). Additionally, upon the end of their experience, volunteers are a dispersing network of conservation, environmental, and sustainable lifestyle ideals (Wearing & McGehee, 2013).

A further benefit to utilizing volunteers at CBC organizations is the increased person-power for collecting data. Volunteers can be a reliable resource for simple tasks in scientific investigation; however, many scientists are skeptical of the validity of volunteer-collected data (Darwall & Dulvy, 1996; Foster-Smith & Evans, 2003; Kremen, Ullmann, & Thorp, 2011). Recently, a number of researchers utilized non-professional and non-specialist volunteers in their projects in order to assess the resulting data (Forrester et al., 2015; Holt, Rioja-Nieto, MacNeil, Lupton, & Rahbek, 2013; Kremen et al., 2011; Lovell et al., 2009; Smith & Evans, 2003). The central finding of these evaluations was that volunteers were capable of performing straightforward tasks but made errors in more complicated studies or when they were not adequately trained (Forrester et al., 2015; Mumby, Harborne, Raines, & Ridley, 1995; Smith & Evans, 2003).

In a comparison of volunteer- and professionally-collected coral reef surveys, volunteer data were most reliable after an intensive eight-day training program and when there was little room for interpretation of the task (Forrester et al., 2015). Forrester et al. (2015) found volunteer-collected data had higher reliability during macro-algae monitoring when the volunteers were trained to identify the specific study species rather than being given general macro-algae descriptions. In more complicated research, such as density estimates of fish populations, volunteer-collected data had low reliability, leading the authors to surmise that volunteers had difficulties surveying animals that move and react behaviorally to the presence of humans (Forrester et al., 2015). Importantly, with specific and intensive education and training on conservation projects and environmental awareness, as well as knowledge of relevant information, the capability of individuals to

perform tasks significantly increased (Aceves-Bueno et al, 2017; Bradley, Waliczek, & Zajicek, 1999; Dolins et al., 2010; Forrester et al., 2015). In summary, the research literature indicates that on projects with straightforward designs that are limited in scope and include training, supervision, and assessment, there is no reason to dismiss volunteers as a research resource (Kremen et al., 2011).

Volunteers might also be an underutilized method of examining organizational success and impact by determining if their experience altered their attitudes and perceptions in line with the organization's promoted ideals. Such an assessment could include self-report qualitative or quantitative measures conducted via interviews, surveys, or questionnaires. In psychology, examinations of Environmental Attitude (EA) and ecological perspective have been well described and validated over the last few decades (Bradley et al., 1999; Dunlap, Van Liere, Mertig, & Jones, 2000; Kaiser, Wolfing, & Fuhrer, 1999; Milfont & Duckitt, 2010). As defined by Milfont and Duckitt (2010), EA is "a psychological tendency expressed by evaluating the natural environment with some degree of favor or disfavor" (p. 80). There is general consensus in the literature that evaluations of perception and attitudes can predict behavior and, conversely, that from examinations of behavior, attitude can be inferred (Bradley et al., 1999; Dunlap et al., 2000; Kaiser et al., 1999; Milfont & Duckitt, 2010).

The vast majority of published research that has included volunteer interviews or questionnaires entails examination of volunteer motivation or satisfaction. My study is largely unconcerned with identifying volunteer motivation or satisfaction and is prioritizing assessments that identify the impact of the volunteer experience on the volunteer's perception and awareness. Though this position is intentional, it is not meant

to undervalue the importance of volunteer satisfaction. Volunteer satisfaction is crucial for CBC organizations in order to ensure the continued participation of willing volunteers; however, volunteer satisfaction assessments are subjective evaluations focused on such questions as *Did you enjoy your assignment? Are you happy here?*, and *Did everyone treat you nicely?* (Ellis, 2012). Volunteer answers to these questions may be largely irrelevant to the actual workings of these institutions and may, instead, reflect individual preference for a volunteer experience. Though volunteer satisfaction is important for CBC organizations, this type of assessment does not evaluate success or impact of the organization or its practices (Ellis, 2012). As Ellis (2012) proposed, a volunteer assessment that reflects the impact or success of an organization should focus on questions that cause volunteers to reflect on the content and objective of their work in relation to the organization's mission.

Study Site

MRCI is a CBC organization located on Nosy Komba, a volcanic island off the northwestern coast of Madagascar. MRCI is a small, government-approved, CBC organization with multilevel and interdisciplinary affiliations. These affiliations include local and international scientific researchers and conservation activists; international volunteers; universities in Madagascar, South Africa, and Germany; Madagascar's Department of Education and Higher Education; the mayor, other officials, and community members of Nosy Komba; and additional conservation and research institutes of Madagascar (MRCI, n.d.). MRCI's mission statement as presented on their website is to:

- Actively participate in the research and conservation of the terrestrial and marine environments in and around Madagascar
- Provide the Department of Education with research
- Assist the Department of Education in educating local fishermen on the importance of marine conservation
- Support and facilitate, where possible, other conservation and research initiatives
- Provide a suitable environment for volunteers to enable them to achieve their conservation and research objectives
- Assist the local communities where possible and to the best of our abilities (MRCI, n.d.).

MRCI managers administer a range of conservation and community outreach initiatives with a multitude of achievements, including building showers and toilets in a village on Nosy Komba, building a dam and water catchment system in order to provide fresh water to the villagers, renovating multiple schools and churches on Nosy Komba, and building a new medical clinic. Forest conservation achievements include receiving 20,000 m^2 of degraded forest to rehabilitate from the mayor of Nosy Komba, hosting an international researcher who identified a new species of parasitic wasp, and implementing the first-of-its-kind agroforest in an attempt to encourage locals to cease slash-and-burn agriculture. Achievements in the marine conservation program consist of constructing an artificial reef with transplanted soft and hard corals under the approval of the Fisheries Minister of Madagascar, receiving a 60,000 m^2 cove and coral reef from the Malagasy government to protect and rehabilitate, and participating in a governmental biodiversity survey organized by Centre Nationale Research Oceanographic as part of a lawsuit to

stop oil drilling in Madagascar. Lastly, MRCI's education program has provided equipment to schools, implemented monthly environment days in order to educate local communities on relevant environmental issues, and offered English classes to adults and children (MRCI, n.d.).

At the time of this study, MRCI supported three primary programs that volunteers, students, and junior researchers could have participated in. Within the community outreach program, individuals could assist in teaching Malagasy students English in local schools and communities; or, they could participate in community development and improve local infrastructure, sanitation, and other aspects of daily life. Voluntourists could participate in the marine conservation program and learn to conduct biodiversity surveys and monitoring techniques, clean-up beaches, and participate in a coral reef regeneration project. In the forest conservation program, voluntourists could investigate Madagascar's subhumid tropical forests and learn avian identification, herpetofaunal survey techniques, and black lemur behaviors and conservation strategies (MRCI, n.d.).

Nosy Komba is locally referred to as Nosy Ambariovato and the Island of Lemurs by tourists (Uncover Travel, 2016), likely referencing the protected black lemur (*Eulemur macaco*) population on Nosy Komba which is considered sacred by the indigenous people (Duke Lemur Center, n.d.). Although a growing ecotourist destination, Nosy Komba lacked island-wide electricity and motorized vehicles at the time of the current study. It is a geographically young, small island that became isolated approximately 8,000 years ago (Andreone et al., 2003; Roberts & Daly, 2014). The island is in the Sambirano phytogeographic domain, nestled between the mainland and Madagascar's largest offshore island, Nosy Be. Nosy Komba's history of tree-felling has resulted in

minimal remaining primary forest, and protection of the secondary forest is limited, leaving the future of its ecosystem uncertain (Andreone et al., 2003; Roberts & Daly, 2014). The island is conical in shape, with its center's highest elevation point reaching 622 m above sea level. Flora at higher altitudes consists of secondary forests, a bamboo forest that is native to Madagascar but introduced to Nosy Komba, and agricultural areas, including banana, pepper, coffee, and sugar cane plantations (Roberts & Daly, 2014).

The number of scientific investigations conducted on Nosy Komba have been insufficient to provide enough details or information to establish specific conservation aims for the Sambirano region. The lack of scientific investigation on Nosy Komba is especially surprising given the microendemic nature of the Sambirano biome, which is considered one of Madagascar's most endangered ecosystems (Mackenzie, 2016; White, 2014). This biome is limited to the northwestern region of Madagascar and to Nosy Be and Nosy Komba. It is floristically unique and provides habitat for many specialized fauna. Examinations of small islands and distinct biomes are integral to our understanding of species endemism, biotic distribution, and adaptive radiation, especially in relation to human disturbance and selective pressures (Diamond et al., 1976; Ganzhorn, Lowry, Schatz, & Sommer, 2001; Goodman & Benstead, 2005). Prior research also indicates that extinctions on small islands occur at an accelerated rate and conducting data collection before increased disturbance is paramount for conservation initiatives (Andreone et al., 2003; Mackenzie, 2016; Roberts & Daly, 2014; White, 2014).

Due to Nosy Komba's recent isolation, ecologists assumed that the island's biotic composition would be similar to that of Nosy Be and the mainland's Sambirano forest habitat (Andreone et al., 2003; Roberts & Daly, 2014). However, after conducting a

herpetofaunal assessment, Roberts and Daly (2014) found notable differences between Nosy Komba and Nosy Be, as well as between Nosy Komba and the mainland. The relative abundance of herpetofaunal species differs between the two islands, with Nosy Komba supporting higher populations of certain species considered rare on Nosy Be. Roberts and Daly (2014) also found significantly fewer amphibians relative to reptiles on Nosy Komba than they found in the mainland's Sambirano region. Lastly, the overall herpetofaunal diversity on Nosy Komba was reduced in comparison to other Sambirano regions (Roberts & Daly, 2014). No other publications that have exclusively investigated Nosy Komba are available in English. The research that is available regarding Nosy Komba is primarily focused on Nosy Be, the mainland, or *Eulemur* investigations and, therefore, provides only incidental details of Nosy Komba (Andreone et al., 2003; Colquhoun, 1993; Mackenzie, 2016; Petter, 1962).

Madagascar is one of the world's biodiversity hotspots and top conservation priorities, in part, because of its high concentration of biotic endemism (Gardner, 2009; Goodman & Benstead, 2005; Myers, Mittermeier, Mittermeier, da Fonseca, & Kent, 2000; Roberts & Daly, 2014; Vences, Wollenberg, Vietes, & Lees, 2009). Even in the scope of biodiversity hotspots, Madagascar is especially significant due to its marked degree of higher-level endemic clades, such as family and genera, including an endemic primate clade of the infraorder Lemuriformes, and high degrees of microendemic species (Gardner, 2009; Goodman & Benstead, 2005; Vences et al., 2009). The high rates of microendemism are due to the number of discrete ecosystems also endemic to Madagascar. These distinct regions are typically separated into three broad climactic zones, including the southern dry spiny desert, the deciduous western tropical forests, and

the eastern rainforests (Wright, 1999). However, there are a number of additional regional subdivisions that relate to climate, topography, and biogeography that provide distinct econiches and that allow for adaptive radiation (Vences, et al., 2009). In-depth research of each discrete ecosystem is both lacking and necessary prior to undertaking specific conservation initiatives.

The Current Study

My primary objective in this study was to explore the impact of a voluntourism experience at MRCI on voluntourists' attitudes toward conservation, the environment, and science. My broader goal was to determine if changes in volunteer perspectives and attitudes have the potential to become an evaluation tool for CBC organizations and programs. My null hypothesis was that there would be no change in volunteer values, attitudes, and perceptions after their experience at MRCI. My alternative hypothesis was that there would be a change in volunteer attitudes, values, and perceptions after their experience at MRCI. My specific predictions were: 1) Attitudes regarding the importance of conservation would increase after a volunteer experience at MRCI; 2) the desire to change behaviors to a greener lifestyle would increase after an experience at MRCI; 3) attitudes regarding the inherent value of nature would increase after an experience at MRCI; and, 4) perceptions of science would improve after involvement in a project that included scientific training.

MRCI routinely hosts 50 to 150 voluntourists from June to September each year and the typical length of stay varies from two to eight weeks. In order to investigate attitude transformations, I developed the volunteer experience evaluation (VEE), which consisted of a pre- and a post-experience self-report survey with quantitative and

qualitative items. I have analyzed data from 45 surveyed participants and prepared my findings for publication in the peer-reviewed journal, *Annals of Tourism Research*.

CHAPTER III

JOURNAL ARTICLE

Abstract

This study utilized conservation psychology theory to explore the impact of a voluntourism experience at a community-based organization. Data on voluntourists' perceptions and attitudes toward conservation, the environment, and science were collected via mixed-method pre- and post-experience surveys. Quantitative findings indicate that the experience improved voluntourists' self-reported attitudes toward sustainable practices but did not alter science attitudes. Overall, participants in programs with scientific training had more positive attitudes toward science, suggesting that voluntourists may self-select into conservation programs due to their attitudes toward science. Qualitative responses mirrored quantitative findings and allowed for a deeper insight into participant perspectives. The current findings suggest that voluntourists select their experiences, in part, due to their understanding of scientific research and that voluntourism can improve attitudes toward environmental sustainability.

Keywords: volunteer tourism, community-based conservation, environmental education, tourism perceptions, environmental attitudes, science attitudes

Introduction

Community-based and volunteer tourism have grown at an explosive rate over the last three decades (Mayaka, Croy, & Cox, 2019; McGehee, 2002; Rattan, Eagels, & Mair, 2012; Wearing, 2001) with international participation in volunteer tourism reaching an estimated 1.6 million worldwide by the early 2010s (Wearing & McGehee, 2013). Such experiences are typically provided via community-based tourism enterprises (CBTE) as well as community-based conservation (CBC) organizations and non-governmental organizations (NGO) (Brooks, Waylen, & Mulder, 2013; Mayaka et al., 2019; Wearing, McDonald, & Ponting, 2005). Programs at these institutions are often geared towards sanctuary work, conservation, scientific research, sustainable development, and assisting local communities in construction, education, community development, and poverty alleviation (Ferrie et al., 2014; Mayaka et al., 2019; Wearing, 2001; Wearing & McGehee, 2013). Proliferation of volunteer tourism has prompted scholarly interest in the social, economic, cultural, and environmental impacts on host communities (Monterrubio, 2019), the efficacy of NGOs, CBTEs, and CBC organizations (Mayaka et al., 2019), and the experiences and perceptions of the tourists themselves (Broad, 2003; McGehee, 2002; McIntosh & Zahra, 2007; Wearing & McGehee, 2013).

Volunteer tourism refers to experiences in which hosting organizations recruit tourists, referred to as voluntourists, to work on projects aimed at community development, research, or conservation while also providing a travel experience (Wearing, 2001). Voluntourism is primarily undertaken by caucasian individuals from developed countries, although there is little consistency in other reported demographics, such as age and gender (Andereck, McGehee, Lee, & Clemmons, 2012; Bailey &

Russell, 2010; McGehee, 2002; Wearing & McGehee, 2013). The impact and ethics of voluntourism is a debated topic (Guttentag, 2009; Wearing & McGehee, 2013) with poorly implemented or managed wildlife tourism linked to disturbance and fragmentation of wildlife populations (Hindinger, 1996; Orams, 2002) and cultural tourism critiques that include reinforced cultural dichotomies, rationalization of poverty, and economic disturbances (Guttentag, 2009). Advocates of voluntourism promote an array of benefits for both the host communities and the voluntourist (Butcher & Smith, 2010; Rattan et al., 2012; Wearing & McGehee, 2013). Many voluntourists help teach English and restore infrastructure while CBC organization employees run conservation and wildlife management initiatives and train voluntourists in ecological monitoring and restoration skills (Butcher & Smith, 2010; Ferrie et al., 2014; Rattan et al., 2012; Wearing & McGehee, 2013).

Voluntourism experiences have been described as transformative in nature (McGehee, 2002), and as positively impacting voluntourists' perceived self-growth, awareness, and attitudes (Broad, 2003; McIntosh & Zahra, 2007; Zahra, 2011). McIntosh and Zahra (2007) found that a cultural voluntourism experience with the Maori in New Zealand was described by participants' during pre- and post-experience interviews as an opportunity for self-reflection, personal improvement, and meaningful relationship development with the local community. Similarly, a wildlife-oriented voluntourism experience in Thailand was characterized by participants' during in-depth interviews as being important for personal growth and skill development, and that their view of life and the world had been transformed (Broad, 2003). The development of social ties made during the voluntourism experience may also increase individual commitment to post-trip

social movement participation and activism (McGehee, 2002). Such findings exemplify the potentially significant transformative nature of voluntourism while also highlighting the need for systematic approaches designed to identify explicit behavioral and attitudinal changes.

Environmental attitude (EA) is "a psychological tendency expressed by evaluating the natural environment with some degree of favor or disfavor" (Milfont & Duckitt, 2010, p. 80) and alternative tourism experiences, in particular, represent a mode of informal education that can influence environmental and conservation favor and commitment, knowledge, and behavioral intent (Ballantyne & Packer, 2005). Weaver (2005) advocated for the potential of enterprises that take an ecosystem-focused holistic approach to foster transformation of participants' ecological attitudes and understanding. While post-experience reports are a common method of evaluating the effects of voluntourism (Halpenny & Cassie, 2003), pre- to post-experience comparisons of EAs and behavioral intent may be a more effective tactic. For example, by employing a pre- to post-visit survey of tourists at an Elephant Nature Park in Thailand, Rattan et al. (2012) found that even a brief visitation to the site increased values and attitudes towards elephants and conservation.

Substantial enhancement of environmental attitudes may depend upon integrating emotional experiences with higher-order reflective opportunities (Ballantyne, Anderson, & Packer, 2010; Ballantyne & Packer, 2009). Ballantyne and Packer (2009) found that educational activities that included reflective responses produced the highest learning outcomes and were the only type of activity to impact environmental attitudes in their research, concluding that "[r]eflective and metacognitive approaches in environmental

education fieldwork experiences have the potential to increase students' self-awareness, deepen their conceptual understanding of environmental issues, and enable them to develop a personally meaningful response" (p. 49). Importantly, although EAs are typically measured via self-report (Milfont & Duckitt, 2010), there is a general consensus that evaluations of perception and attitudes can predict behavior and, conversely, that attitude can be inferred from examinations of behavior (Bradley, Waliczek, & Zajicek,1999; Dunlap, Van Liere, Mertig, & Jones, 2000; Milfont & Duckitt, 2010). EA measurement instruments, such as the Environmental Attitude Inventory, have been well described and validated over the last few decades (Dunlap et al., 2000; Kaiser, Wolfing, & Fuhrer, 1999; Milfont & Duckitt, 2010), but do not appear to be commonly utilized to evaluate pre- to post-voluntourism experience attitude and behavioral intention transformations.

Voluntourist experiences may also change attitudes toward scientific practices given the increasing use of voluntourists for data collection (Foster-Smith & Evans, 2003; Holt, Rioja-Nieto, MacNeil, Lupton, & Rahbek, 2013; Lovell, Hammer, Slotow, & Herbert, 2009; Smith & Evans, 2003). Since the 1980s, a sharp decline has been noted in scientific self-efficacy and attitudes toward the sciences in middle school through university students in the United States and Europe (Osborne, Simon, & Collins, 2003). In particular, a disparity exists between students' attitudes toward formal classroom education and attitudes toward general science which is seen as interesting, useful, and relevant (Osborne et al., 2003). In a formal classroom setting, Ballen, Wieman, Salehi, Searle, and Zamudio (2017) found that active learning that involved hands-on participation increased knowledge retention and fostered greater scientific efficacy than

did traditional lectures. A review of informal learning experiences that incorporated active learning components found evidence that this approach may improve participant attitudes and knowledge of the environment (Ballantyne & Packer, 2005). However, as noted by Brossard, Lewenstein, and Bonney (2005), there is a lack of research on how conservation programs as informal learning experiences can impact participant attitudes, self-efficacy, and knowledge toward science. Those authors found that volunteering in an ornithology project increased knowledge specifically related to ornithology but not in relation to general scientific practices and did not alter attitudes toward science (Brossard et al., 2005).

We explored and measured the transformative impact of a voluntourism experience at a CBC organization on voluntourists' attitudes toward conservation, the environment, and science using a mixed-method pre- to post-experience self-report survey entitled the Volunteer Experience Evaluation (VEE). The survey was constructed with items designed to have participants reflect on the content and objective of their work in relation to the project's mission; outcomes which may ultimately be utilized to evaluate an organization's impact or success (Ellis, 2012). As well, it is hoped that investigations of volunteer attitude may contribute to "the development of criteria and credentials for good practices in volunteer tourism" (Wearing & McGehee, 2013, p. 127). We predicted that the voluntourism experience, particularly one that incorporated scientific training, would facilitate attitude transformation, but that the strength of any effects might occur differentially across subject areas or be differentially revealed by qualitative and quantitative survey techniques.

Methods

Study Site

Madagascar Research and Conservation Institute (MRCI) is a CBC organization located on Nosy Komba, which is a small island off the northwestern coast of Madagascar and lacks electricity, plumbing and irrigation, roads, grocery stores, and trash systems (Roberts & Daly, 2014; MRCI, n.d.). MRCI is an example of a holistic, ecosystem-focused CBC organization where administrators have interests in systematic data collection and have prioritized a wide array of conservation issues that plague the local biodiversity and people. They promote sustainable lifestyle choices during daily camp life, and their initiatives range from community outreach and education, community development and construction, sustainable resource management, and research of marine and terrestrial biota. At the time of data collection, voluntourists could choose to participate in one of three primary programs: community outreach, marine conservation, or forest conservation, with the latter two programs including scientific training and data collection elements.

Study Sample

Participants consisted of 45 voluntourists surveyed between June and September, 2018. The majority of the participants were caucasian and between 18 and 25 years of age with nearly equal gender representation. Level of education was variable, with approximately half the sample having attended some college or less and half the sample having earned a four-year degree or higher. See Table 1 for participant demographics.

Table 1

Participant Demographic Characteristics (n = 45)

Demographic Variable	Participants
Volunteer Program	
Forest conservation	23
Marine conservation	8
Community outreach	14
Length of Stay	
1-3 weeks	22
4+ weeks	23
Age	
18-21	25
22-25	10
26+	7
Gender	
Male	22
Female	23
Level of Education	
High school only	7
Some college	14
4-year degree	16
Graduate degree	7

Volunteer Experience Evaluation (VEE)

The VEE consisted of two self-report surveys that included 46 items per survey rated on a 6-point Likert scale from 1 (*strongly disagree*) to 6 (*strongly agree*). The VEE

was designed to measure volunteer attitudes and perceptions of: 1) Environmental awareness and conservation (17 items); 2) sustainable lifestyle choices (6 items); 3) academia and science (12 items); and 4) CBC organizations and conservation policy (11 items). We adapted 17 of the 46 items from EA scales by Dunlap et al. (2000) and Milfont and Duckitt (2010) which were included to measure environmental awareness and conservation perceptions and attitudes. An additional 29 items were constructed in a similar format to the EA items in order to measure the latter three areas of interest. Because the sample included non-native English speakers, *I do not understand the question* was provided as a response option for all items.

Open-ended questions permitted participants to freely express their own ideas and, potentially, voice constructs not included in the quantitative items. In the pre-experience survey, one question asked voluntourists about their expected attitude change and was included as a reflective response item (Ballantyne & Packer, 2009). We administered four open-ended questions both pre- and post-experience to examine attitude transformations on: 1) Sustainable practices; 2) planned dissemination of knowledge; 3) volunteer motivations; and 4) academia and science. Survey format was identical pre- to post-experience except for the first page. In the pre-experience survey, the first page collected demographic information and included the pre-experience reflective response item. In the post-experience survey, the survey's first page asked the participants for their length of stay, the likelihood of them repeating their experience, and their overall perception of their experience. We matched completed pre- and post-experience surveys for each participant and discarded identifiers after corresponding surveys were collected.

Procedure

Participation was voluntary with pre-experience recruitment occurring on each incoming volunteer groups' first day after their camp and health and safety orientations. We obtained informed consent prior to data collection, and all procedures were approved by Central Washington University's Institutional Human Subjects Review Council. Post-experience data collection occurred on each voluntourists' last day, following interviews conducted by MRCI administrators to evaluate the voluntourists' overall experience during their stay. We administered surveys via paper-and-pencil, with respondents allowed as much time as needed to complete the surveys and with the primary investigator remaining in the vicinity to answer any questions, particularly regarding word difficulties for non-native English speakers.

Two individuals conducted data entry of the quantitative items, and all entries were compared to ensure reliability. *I do not understand the question* responses numbered 10 across all surveys and were initially entered as 0 so as to differentiate from blank responses, but were recorded as blanks for statistical analyses. Thematic content analysis of responses to the qualitative items was conducted by a six-person team over a multi-step iterative process in which each step was assessed for interrater reliability. In the first step, responses were transcribed by pairs to ensure reliability. In the second step, six individuals independently reviewed a total of 135 responses, 45 responses to a pair, and identified reoccurring themes which were, then, compared for consistency in application and definition. This step yielded an initial 17 identified themes. In a third step, all six individuals applied these 17 themes to 45 new responses, after which theme modification occurred in response to interrater inconsistency. Theme modification

involved combining themes of similar content and removing themes deemed inconsequential, including three themes pertaining to how respondents planned to share knowledge learned during their experience (e.g., lead by example, teach, etc.).

Ultimately, thematic content analysis yielded ten themes. Five themes were identified in both the pre-experience reflective response item and in pre- and post-experience questions on sustainable practices, dissemination of information, and volunteer motivations. The other five themes related to the pre- and post-experience questions on scientific attitudes. Three individuals coded all 373 responses using these final ten themes, resulting in an 78.3% rating concurrence. The same three individuals reviewed non-concurrent responses until 100% concurrence was reached on final theme identification.

Results

Quantitative Item Analysis

Prior to the analysis, data from three subjects were eliminated due to incomplete surveys (i.e., one or more blank pages on either the pre- or post-experience survey), resulting in a remaining sample of 42 participants. Eleven survey items pertaining to conservation policy and CBC organization construction and two reverse-coded environmental attitude items were eliminated prior to analysis due to participant feedback that those items were confusing or had terms or issues unfamiliar to the multilingual, international sample. Evaluations of skewness and kurtosis resulted in the removal of two further environmental attitude items and two science attitude items with skewness or kurtosis values of ± 2.0 or greater. Responses on the remaining items were screened for multivariate outliers via Mahalanobis distance with no outliers identified.

Exploratory Factor Analysis. Exploratory factor analysis utilizing varimax rotation was conducted to determine what, if any, underlying structure existed for the remaining 29 items in the VEE. Initially, three components with eigenvalues greater than 1.0 were identified; however, factor loadings revealed that six items did not meet a 0.45 loading threshold onto any component. After removing those items, a second factor analysis with the remaining 23 items confirmed two components with eigenvalues greater than 1.0. Seven items did not meet the 0.45 threshold, leaving 16 items distributed across two factors. Factor 1, *sustainable actions,* contained seven items with positive loadings that included EA and sustainable lifestyle issues. Factor 2, *pro-science attitudes,* contained eight items with positive loadings and one item with a negative loading that included environmental and science attitude questions. See Table 2 for factor analysis details.

Changes in Volunteer Attitudes. Factor scores for *sustainable actions* and *pro-science attitudes* were calculated for each participant by averaging their responses for items in that factor, resulting in pre- and post-experience scores for each factor for each participant. The *a priori* assumption was that the voluntourist experience, itself, as well as scientific training as part of the experience would impact these factors. Therefore, factor scores were analyzed via separate repeated measures analysis of variance (ANOVA) for the effects of pre- to post-volunteer experience and the presence of scientific training as part of the experience. The ANOVA for *sustainable actions* revealed main effects of the volunteer experience, $F(1, 40) = 5.40$, $p < 0.05$, $\eta^2 = 0.12$, with scores increasing from pre-experience ($M = 4.7$, $SD = 0.1$) to post-experience ($M = 5.0$, $SD = 0.7$). There were no main effects or interactions of science training on *sustainable actions*

Table 2

Means and Standard Deviations for Items from the VEE Pre- and Post-Experience, Arranged by Factor. Higher Scores Reflect More Positive Attitudes.

Question	Loading Score	Pre *M*	Pre *SD*	Post *M*	Post *SD*
Factor 1: Sustainable actions. *Eigenvalue (variance) = 3.01 (18.9%)*					
I plan on reducing my use of energy	0.84	4.6	1.1	5.0	0.9
I plan on using less water daily	0.78	4.6	1.1	4.8	1.1
I make a daily effort to make choices that prioritize the environment	0.74	4.6	1.0	4.8	1.2
I will reduce, reuse, and recycle more in the future	0.74	5.1	0.9	5.2	0.7
I will encourage others to use fewer resources daily	0.72	4.7	1.1	4.8	1.2
I feel very responsible towards protecting the environment	0.66	5.2	0.7	5.3	0.7
I am confident I know how to make less material waste daily	0.58	4.4	0.8	4.9	0.9
Factor 2: Pro-science attitudes. *Eigenvalue (variance) = 4.97 (31.1%)*					
I understand the scientific method	0.82	4.5	1.7	5.0	1.5
I would like to participate in an academic research project	0.77	4.9	1.0	5.0	1.0
I trust scientific research	0.77	5.1	0.9	5.2	1.1
I am confident that I can collect data in an academic research project	0.73	4.7	1.0	4.9	1.4
Volunteers and nonprofessional citizens can contribute to academic research	0.64	5.2	0.8	5.2	0.8
Scientific research is necessary in order to learn how to protect ecosystems	0.59	5.3	0.7	5.2	0.7
Scientific research can empower me to make greener lifestyle choices	0.58	5.2	0.7	5.3	0.6

Table 2 (Continued)

Question	Loading Score	Pre *M*	Pre *SD*	Post *M*	Post *SD*
Most habitats in the world have been modified by humans	0.46	5.1	1.0	4.9	1.0
*Professionals are the only ones who can protect biodiversity	-0.46	2.3	1.1	2.0	0.9

*For calculations, this item was reversed coded

scores. The ANOVA for *pro-science attitudes* showed a main effect of science training, $F(1, 40) = 5.2$, $p < 0.05$, $\eta^2 = 0.11$), with participants in programs with science training having higher scores ($M = 5.2$, $SD = 0.5$) than participants in programs without science training ($M = 4.9$, $SD = 0.5$). There were no main effects or interactions of the voluntourism experience *on pro-science attitudes*.

Correlations. In order to determine if factor scores were interrelated or varied based upon participant variables, correlational analyses were conducted on pre-to-post-experience difference scores for each factor and participant variables of gender, length of stay, and age. The pre-to-post-experience difference score for *sustainable actions* was positively correlated with the *pro-science attitudes* difference score, $r(40) = 0.48$, $p = 0.001$. No other correlations were observed; pre-to-post-experience difference scores were not associated with differences in gender, length of stay, or age.

Qualitative Item Analysis

As previously noted, 373 responses to the qualitative items were evaluated via thematic content analysis. Responses averaged 13.9 words ($SD = 10.6$) and 1.2 themes ($SD = 0.8$). Thematic content analysis revealed five themes that applied to the pre-experience reflective response item and the pre- and post-experience questions about

sustainable practices, dissemination of information, and volunteer motivations. Those themes included: 1) making a difference, including responses with targeted beneficiaries such as the locals or the environment; 2) real world experience, describing personal skill development or education; 3) desire to travel, referencing the travel experiences itself as the important experience factor; 4) living with less, with references to using and wasting fewer resources and participating in sustainable practices; and 5) environmental awareness and concern, including descriptions of nature or concern for negative human impact such as pollution and deforestation. See Table 3 for a summary of the question prompts, themes, and pre- and post-experience response frequencies.

Five themes were related to science attitudes and included: 1) human development and survival, with responses suggesting science as beneficial for the survival of humans and development of technologies; 2) human education and advocacy, describing science as important for public education and policy making; 3) understanding the world, with science seen as helping people understand the environment or create a world view; 4) save the environment, for responses discussing science as useful to protect the environment; and 5) unfavorable elements, for responses that included unfavorable perceptions of science, such as the complexity of the scientific method or confusing discourse. Because of the main effect of science training on the *pro-science attitudes* factor, the science attitude content analysis is presented separated for participants who did and did not have science training as part of their voluntourist experience. Table 4 provides a summary of the science attitude prompt, themes, and pre- and post-experience response frequencies.

Table 3

Qualitative Survey Items and Theme Frequency for Environmental Attitude and Volunteer Motivation Questions

Qualitative Survey Items and Identified Themes	Pre-Experience Response Frequency	Post-Experience Response Frequency
How do you think your volunteer experience will change your attitude about the environment or conservation?		
Environmental awareness and concern	62% (28/45)	
Real world experience	18% (8/45)	
Living with less	13% (6/45)	
Make a difference	7% (3/45)	
What do you expect to learn about more sustainable lifestyle choices? What did you learn about sustainable lifestyle choices?		
Living with less	44% (17/39)	74% (28/38)
Environmental awareness and concern	36% (14/39)	26% (10/38)
Real world experience	15% (6/39)	0%
Make a difference	5% (2/39)	0%
How would you encourage others to make greener lifestyle choices?		
Environmental awareness and concern	87% (13/15)	67% (10/15)
Living with less	13% (2/15)	33% (5/15)
What is your reason for volunteering at MRCI? What was the most significant part of your experience at MRCI?		
Real world experience	46% (31/67)	76% (55/72)
Make a difference	37% (25/67)	19% (14/72)
Desire to travel	16% (11/67)	0%
Living with less	0%	1% (1/72)
Environmental awareness and concern	0%	3% (2/72)

Table 4

Theme Frequency in Response to the Science Attitude Question for Participants Who Received or Did Not Receive Science Training as Part of Their Experience

Qualitative Survey Item and Identified Themes	No Science Training		Science Training	
	Pre-Experience Response Frequency	Post-Experience Response Frequency	Pre-Experience Response Frequency	Post-Experience Response Frequency
Briefly describe what you think about academic research and science				
To save and protect the environment	25% (4/16)	17% (2/12)	33% (8/24)	28% (8/29)
Understand the world	37% (6/16)	33% (4/12)	21% (5/24)	21% (6/29)
Human education and advocacy	13% (2/16)	25% (3/12)	33% (8/24)	21% (6/29)
For human development and survival	19% (3/16)	17% (2/12)	12% (3/24)	7% (2/29)
Unfavorable elements	6% (1/16)	8% (1/12)	0% (0/24)	24% (7/29)

Q As detailed in Table 3, environmental awareness and concern and living with less were the most frequently identified themes in response to the pre-experience prompt and the questions on sustainable actions and dissemination of information. Living with less showed a substantial increase in frequency post-experience. Gaining real world experience, such as learning data collection procedures, teaching English, or building infrastructure, was the most frequently described theme for the pre-to-post volunteer motivation question and increased in frequency post-experience. Making a difference was the second most common theme in the pre-experience motivation responses, but

decreased post-experience and, notably, the desire to travel was the third most frequent theme in the pre-experience motivations but was not present in the post-experience responses. The pre- and post-experience responses describing science perceptions, refer to Table 4, included environmental components with the majority of responses referencing science as being important to protect or to understand the environment. Those individuals who did not experience science training most commonly referred to science as beneficial to understand the world and those with science training most frequently described science as important for protecting the environment. Interestingly, after their experience, responses from individuals that received science training increased in reported unfavorable elements of science.

Discussion

There are few investigations into the effects of voluntourism experiences on participants' attitude changes toward environmental awareness, conservation, and science (Wearing & McGehee, 2013; Brossard et al., 2005). Therefore, my findings are a significant step in evaluating and documenting such changes following a voluntourism experience. Volunteer responses to quantitative survey items revealed two components, *sustainable actions* and *pro-science attitudes*, with individuals showing an increased commitment to *sustainable actions* after their voluntourist experience. Surprisingly, *pro-science attitudes* did not change due to the voluntourist experience itself; however, those with higher *pro-science attitude* scores were more likely to self-select to participate in the conservation-related programs that included scientific training. *Pro-science attitudes* pre-to-post-experience difference scores were positively associated with *sustainable actions* difference scores but gender, age, or length of stay were not associated with these

measures. Lastly, thematic content analysis of qualitative items mirrored the components identified in the quantitative item analysis while providing details regarding respondents' reactions to the realities of the voluntourist experience, their capability to perform sustainable practices, their goals for disseminating newfound knowledge, and their thoughts about scientific research.

The *sustainable actions* theme included quantitative items concerning environmental attitudes, commitment to participate in sustainable lifestyle choices, desire to advocate greener living to others, and confidence in one's ability to make ethical lifestyle choices. Qualitative responses also focused on a commitment to using and wasting fewer resources each day as well as environmental awareness and concern of human impacts on the environment, supporting Ballantyne and Packer's (2005) assertion that environmental education in an informal setting can positively impact environmentally sustainable attitudes and behavioral intent. Our findings also mirror prior research demonstrating greater awareness of environmental sustainability concerns following alternative tourism experiences at zoos and aquariums (Adelman, Falk, & James, 2000) and increased support for engaging in environmentally sustainable lifestyle choices after experiencing wildlife tourism in Australia (Ballantyne, Packer, & Falk, 2011).

Pro-science attitudes was the second theme identified from quantitative item analysis which pertained to participants' scientific efficacy, science attitudes, and perception of the role of science in conservation. Consistent with *sustainable actions*, qualitative responses mirrored this quantitative theme, with the benefits of science commonly described as understanding the world and helping to protect the environment.

Links between science and environmental conservation have also been documented in voluntourists' self-reports at a turtle conservation project, in which conservation and science were the most commonly paired themes in respondents' descriptions of their experience (Campbell & Smith, 2006). While Campbell and Smith (2006) did identify a science theme in their volunteer responses, their theme focused only on the actual voluntourism experience and not on science attitudes in general. Other researchers have constructed surveys pertaining to participants' science attitudes for use following informal educational experiences (Brossard et al., 2005; Jordan, Gray, Howe, Brooks, & Ehrenfeld, 2011) or to explore science attitudes and efficacy of citizen scientists participating in research projects for professional researchers (Brossard et al., 2005; Jordan et al., 2011). Given the parallels between volunteer-based service-learning activity and voluntourism experiences at CBC organizations (Ballantyne & Packer, 2005) as well as the growing use of voluntourists for data collection in the field (Aceves-Bueno et al., 2017), it may be important to begin broader examinations of voluntourists' scientific views.

The voluntourist experience increased scores on *sustainable actions*, suggesting an enhanced confidence and commitment to sustainable lifestyle choices and an increased individual connectedness to nature after their experience. These findings are consistent with those of Halpenny and Cassie (2003) in which voluntourists characterized their work on nature conservation projects as resulting in important action to save the environment as well as increasing their commitment to environmental sustainability and environmental awareness. Our findings also contribute to a growing body of evidence that knowledge, understanding, and commitment to sustainable practices can increase after informal

environmental education experiences at alternative tourism enterprises (Ballantyne & Packer, 2005). While the relationship between self-reported attitudes and behavioral changes have been debated, and attitude changes have been shown to decrease over time in some studies (Adelman et al., 2000; Ballantyne & Packer, 2005; Milfont & Duckitt, 2010), there is evidence that environmental knowledge, values, and behavioral intention are strong predictors of actual ecological behaviors (Kaiser et al., 1999).

In general, respondents in our study demonstrated high *pro-science attitudes* scores on both their quantitative and qualitative responses, but the voluntourist experience did not alter those attitudes. Similarly, Brossard et al. (2005) found increased knowledge of bird biology but no changes in science attitudes, general science knowledge, or scientific efficacy after participation in an ornithology research project. Those researchers speculated that the complexity of science attitudes, novelty of evaluation instruments, and species-specific training in their program may have limited generalization to broader scientific attitudes (Brossard et al., 2005). Likewise, participants in invasive plant species research showed improved invasive plant knowledge and general conservation literacy but not general science knowledge (Jordan et al., 2011). Those authors postulated that such experiences may be too superficial for the type of deep learning that would allow for an increase of general science knowledge (Jordan et al., 2011).

Our findings, along with these prior investigations, exemplify the difficulties associated with gauging attitudes toward science as well as the nebulous concept of science attitudes. Drawing on three decades of research, Osborne et al. (2003) defined attitudes towards science as "feelings, beliefs, and values held about an object that may be the enterprise of science, school science, the impact of science on society, or the

scientists themselves" (p. 1053). Attitudes toward science are convoluted by these numerous subconstructs that differentially impact each individuals' overall science attitude (Osborne et al., 2003). Research exploring attitudes toward science is complicated by inconsistency across scientific disciplines as well as varying definitions of science itself (Ballen et al., 2017; Brossard et al., 2005; Osborne et al., 2003). Despite this, it may still be useful to determine if specific science components or training could be impactful on participants' attitudes toward science.

Notably, we found that those who self-selected into the conservation programs, which included science training components, had higher *pro-science attitudes* scores as compared to participants of the community outreach program at my site. This finding suggests that volunteers with more positive science perceptions are pursuing a distinct voluntourism experience and may contribute a different set of skills to the organization and program. One benefit to utilizing volunteers in research is the increased person-power for collecting data (Aceves-Bueno et al., 2017; Foster-Smith & Evans, 2003; Holt et al., 2013; Lovell et al., 2009) and there has been a noted increase in the utilization of citizen scientists in data collection (Aceves-Bueno et al., 2017; Brossard et al., 2005; Jordan et al., 2011). As the inclusion of these non-professional volunteers in research progresses, it may be useful to determine if specific volunteer characteristics are associated with more reliable data collection. The current finding suggests that researchers and CBC organizations that recruit volunteers specifically for scientific investigations and data collection should focus their recruitment efforts on individuals with pro-science attitudes and higher scientific self-efficacy.

Pre-to-post *sustainable actions* difference scores were positively associated with

pro-science attitudes difference scores, but neither of the difference scores were related to participants' age, gender, or length of stay. Volunteer motivations and responses have previously been shown to also be independent of age, duration of experience, previous experience, or nationality in a sample from Thailand (Kontogeorgopoulos, 2017). Though McGehee (2002) found that previous social movement participation predicted post-experience behavioral intentions, that study reported no relationship between post-experience responses and demographic variables. Those findings in combination with the current results are unexpected given well-documented gender differences in environmental concerns and attitudes, with women expressing higher concern than men (Bord, & O'Conner, 1997; Zelezny, Chua, & Aldrich, 2002) and men typically having higher scientific efficacy than women (Ballen et al., 2017). The lack of observed gender differences, in addition to no age differences, may reflect the limited demographic range of the voluntourist population. Voluntourism is as an important gap year endeavor common for recent high school or college graduates who seek real world experiences (Butcher & Smith, 2010; Guttentag, 2009; Wearing et al., 2005). Further investigation of participant demographics, particularly gender and age differences, across a variety of CBTEs and volunteer experiences would be ideal to better understand this phenomenon.

Thematic content analysis revealed that, in their pre-experience reflective responses, participants primarily anticipated gaining greater environmental awareness and concern, specifically learning about human impacts on the environment and new sustainable practices. Given the analysis of their quantitative post-experience responses, voluntourists predicted their own increases in *sustainable actions,* suggesting accurate metacognitive assessment. In prior research, such metacognitive activities were described

as most effective in transforming environmental knowledge, attitudes, and behaviors in students during educational experiences (Ballantyne et al., 2010).

Qualitative items in our study also asked participants to reflect upon what they expected to and had learned regarding sustainable lifestyle choices, mirroring a similar reflective activity utilized by Ballantyne et al. (2010) to encourage deeper environmental understanding and awareness. Importantly, while incoming voluntourists in our study reported expecting to learn how to live with less, that theme was substantially increased and most prominent in responses after their experience, suggesting strong personal behavioral intentions for lifestyle changes. This finding mirrors prior research showing that hands-on, active-learning programs contribute to attitude transformation (Ballantyne et al., 2010; Ballantyne & Packer, 2005; Ballantyne & Packer, 2009). During their voluntourism experience, participants lived with less due to the lack of common first world amenities such as electricity, personal technological devices, and plumbing. Environmental awareness and concern and living with less were also the only two themes in response to the question of how participants would encourage others to make greener lifestyle choices. In their responses, participants described sharing information on pollution, deforestation, and other human impacts as well as the relative ease of using fewer resources in order to encourage others to make sustainable lifestyle choices.

Exploration of voluntourists' motivations represents a huge portion of the voluntourism literature, revealing that motives are often split into altruistic desires to make a difference and egoistic or self-interest motives (Benson & Seibert, 2009; Butcher & Smith, 2010; Wearing & McGehee, 2013). Prior studies have expanded this research and identified volunteer motivators such as the desire to gain experience and education,

to have a cultural experience, to learn about the country and culture, to experience nature, to travel to a new country, and for self-growth (Benson & Seibert, 2009; Broad, 2003). We also found a combination of altruistic and egoistic motivators at participants' arrival, with the egoistic motive of gaining real world experience and the altruistic motive of making a difference as the two most frequently identified themes. The third most common, and only other pre-experience theme identified, was the desire to travel for a new experience. To our knowledge, ours is the first investigation to compare motivations prior to and after a volunteer experience, and these motivational themes showed large differences in their appearance post-experience. The real world experience theme displayed a dramatic increase in responses. Making a difference decreased slightly, and desire to travel was completely eliminated. Again, these findings suggest that the hands-on experiences and knowledge gained, such as technical skill development for research and sustainable development, are significant factors of the voluntourism experience and should be prioritized by CBTEs.

Responses concerning academic research and science revealed that respondents perceived academic research and science as beneficial for saving and protecting the environment, helping the public understand the world, and human education and advocacy. Pairings of conservation, environment, and science-related themes were also observed by Campbell and Smith (2006). Interestingly, those who received science training in the current study also discussed unfavorable elements about science more frequently after their experience. This may reflect a more nuanced understanding of science. Responses primarily referred to the difficulties of nonprofessionals in grasping academic literature and described the confusion associated with trying, as well as the

difficulties associated with understanding the scientific method and participating in data collection. Many participants reported that this was their first exposure to data collection procedures and, for some, it created feelings of confusion at the complexity of scientific discourse. One individual wrote "*Science is really important, but sometimes hard to understand if you don't work in this field*." Reports of science attitudes in the literature describe similar negative perceptions in which students often refer to scientific disciplines as complex or "chilly" (Ballen et al., 2017; Osborne et al., 2003). However, it should be noted that despite this increase of unfavorable elements, all responses contained general pro-science attitudes and no response had only negative science perceptions.

Conclusion

Tourism research, in general, tends to be host-centered, examining economic, social, and environmental impacts from the host perspective (Monterrubio, 2019). However, there is a small but growing body of research examining voluntourists' motivations or post-experience attitudes and perceptions (Wearing & McGehee, 2013). Generally, such studies have relied on qualitative methodologies, such as interviews, participant observation, and field notes and diaries (Broad, 2003; Campbell, & Smith, 2006; Halpenny, & Caissie, 2003; McIntosh & Zahra, 2007). While detailed ethnographic case studies into the impacts of voluntourism experiences on later life choices (Zahra, 2011) or interviews and observations on the self-reported significance of such voluntourism experience (Broad, 2003) contribute to our understanding, few researchers have measured voluntourists' perceptions and attitudes both before and after their experience. Those studies that have interviewed participants before and after their

experience differed from the current investigation in significant ways. For example, specific changes in attitude or perception were not found (McIntosh & Zahra, 2007), social movement participation and network building were investigated rather than environmental attitudes (McGehee, 2002), or the study did not specifically evaluate voluntourists (Rattan et al., 2012).

In conclusion, this study represents a novel approach to investigating voluntourism impacts by employing a mixed-method instrument to examine voluntourists' attitude transformation at a CBC organization. This study compared voluntourist attitudes towards environmentally sustainable practices, and volunteer perceptions of science prior to and after their experience. Findings demonstrated that the volunteer experience improved attitudes towards participating in sustainable practices and environmental awareness, and that respondents with higher pro-science attitudes were more likely to choose a conservation program with research components. Notably, the volunteer experience itself was the only identified influencer of attitude transformation despite the potential for social desirability and ceiling effects in pro-environment attitudes and support for sustainable behaviors among arriving voluntourists. This suggests that the VEE may have the potential to become a standardized measurement of impact and success in the voluntourism sector, although additional investigations in CBTEs and CBC organizations is necessary to establish validity and reliability of such an instrument, particularly for non-native English speakers.

Due to the inherent variability of voluntourism experiences, we are limited in the generalization of these findings to other CBTEs and CBC organizations, although our results are consistent with previous reports that voluntourism experiences yield positive

impacts for the voluntourist (Halpenny & Caissie, 2003; McIntosh & Zahra, 2007; Zahra, 2011) such as contributing to life turning points and role transitions in relation to career development (Broad, 2003). While a voluntourist experience may allow for more authentic encounters than traditional, institutionalized mass tourism (McIntosh & Zahra, 2007), these experiences may also have the potential to influence the hosting organizations. We agree with McGehee's (2002) assertion that continued investigation into the impact of experience at CBTEs on volunteer attitude transformations has the potential to assist these organizations in developing best practices in program design and volunteer recruitment as well as for creating better standards and measurements of success. For example, when designing research and conservation related programs, it could be useful to identify which participants are best suited for particular programs and may produce the most reliable results. Understanding attitude transformation as a result of the volunteer experience may help organizations evaluate the impact of their offered programs, promoted ideals, and practices which could, in turn, aid in program development and implementation.

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CHAPTER V

CONCLUSION

My primary objective in this study was to explore effects of a voluntourism experience at a CBC organization on participants' attitudes toward conservation, the environment, and science. My secondary goal was to design and test an instrument capable of capturing this attitude transformation. My hypothesis that there would be a change in volunteer self-reported attitudes, values, and perceptions after their experience at MRCI was supported, and it was confirmed that the VEE was capable of capturing attitude transformations. My predictions regarding increased attitude scores towards conservation, sustainable practices, and nature after a voluntourist experience were also supported in this study. Self-reported attitudes and perceptions of science did not increase after the voluntourist experience, although science attitude scores were differential across program type, with individuals in the conservation-related programs that included science training reporting greater pro-science attitudes.

One potential explanation for the increase I observed regarding commitment to sustainable actions and perceptions of the environment may be because volunteers directly participated in sustainable practices and conservation initiatives throughout their time at MRCI. Previous investigations of first-hand experiences, such as interactions with wildlife, zoo or reserve visitations, or field trips, found that such experiences positively influenced the perceptions, attitudes, and knowledge of the visitors with regard to that specific subject (Luebke, Watters, Packer, Miller & Powell, 2016; Prokop, Tuncer, & Kvasnicak, 2007). The setting of the current study on Nosy Komba, an isolated island off the northwestern coast of Madagascar's mainland, immersed volunteers in an

environment lacking electricity, plumbing and irrigation, roads, grocery stores, and trash systems (Andreone et al., 2003; Roberts & Daly, 2014; MRCI, n.d.). For the majority of participants, this was their first experience living without immediate access to electricity and running water. Thus, the first-hand experience of living with alternative resources and fewer amenities may be an important element for CBTEs planning volunteer programs that aim to enhance attitudes toward sustainable actions.

The increase in responses to the *sustainable actions* theme I observed is especially noteworthy given the potential for social desirability and ceiling effects for responses to these items on arrival at MRCI. Volunteers are thought to exhibit high pro-environment and sustainable behaviors and attitudes pre-experience, because they have devoted considerable time and finances to volunteer at a CBC organization. Despite the potential for inflated ratings on the arrival surveys, the experience at MRCI was still impactful enough to increase reported commitment to sustainable actions and perceptions of the environment regardless of past experience, gender, age, or length of stay. Thus, my findings clearly provide evidence of the positive impact of a volunteer experience consistent with previous reports (Broad, 2003; Campbell & Smith, 2006; Halpenny & Caissie, 2003; Kontogeorgopoulos, 2017; McIntosh & Zahra, 2007).

For example, in a qualitative study, McIntosh and Zahra (2007) found that a voluntourist experience allowed for more authentic encounters than traditional institutionalized mass tourism and that the voluntourists' felt they received a more impactful cultural experience and self-growth obtained from helping others. Furthermore, when utilizing the anthropological method of participant observation with voluntourists' at a primate sanctuary in Thailand, Broad (2003) identified impacts she characterized as

life-turning points and role transitions, including career changes, new romantic relationships, and permanent relocations to Thailand. In an investigation of the relationship between tourism and spirituality in seniors, Moal-Ulvoas (2017) conducted in-depth interviews in which participants described their experience as providing meaning to their lives and enhancing their spirituality.

My research represents a novel approach to investigating voluntourism impacts by employing a pre-to-post-experience mixed-method research design to examine voluntourists' attitude transformation. My findings suggest VEEs may have the potential to become measurements of impact and success in the voluntourism sector. Additional testing of a VEE at a variety of CBTEs and CBC organizations would be necessary to establish validity and reliability of such an instrument. It is important to note that the survey utilized in this study was designed and administered in English. For many respondents, English was a second language, potentially limiting their capacity to fully describe their experience in the short response questions on the survey. Given the need to continue voluntourism impact analyses due to the proliferation of these organizations, and the inherent international population of the voluntourism sector, a systematic VEE instrument would need modification to accommodate voluntourists in their native language.

My study examined the impact of only one voluntourism experience on attitude transformations at an institute in Madagascar which offered an experience focused on environmental research for conservation purposes as well as community outreach and education. This may limit the generalizability of my findings to other voluntourism experiences. However, as McGehee (2002) asserted, I agree that investigations such as

this one may have the potential to assist organizations in developing best practices in program design and volunteer recruitment. For example, identifying the nature of voluntourist science attitudes and self-efficacy by program type may assist program administrators in developing volunteer recruitment materials and in their marketing strategies so that specific participants may be targeted. Additionally, I posit that with continued investigation into voluntourist experiences and CBTEs, and knowledge sharing via publication, better standards and measurements of success can be developed. Understanding attitude transformation as a result of the volunteer experience may help organizations evaluate the impact of their experiences and practices which could, in turn, aid in program development and implementation.

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APPENDIXES

Appendix A – **Pre-Experience Survey**

If at any point you do not understand a question, or need help reading the questions, please let the investigator know. In this survey, *sustainable* means that the rate of something being used can be maintained without destroying the environment and more is grown or produced at a faster rate than it is used.

In the section below, please fill in your personal information and circle the option that best fits you, when necessary. This information will be used to keep track of the surveys and will not be shared with anyone other than the investigator.

Current Date: DD/MM/YYYY	**Length of visit at MRCI:**			**Volunteer or Intern**	
Name:			**Age:**		
Project followed at MRCI:	**Forest**	**Community Outreach**		**Marine**	**Education**
Highest level of Education:	**High School**	**Some College**	**BA/BS**	**MA**	**PhD**
How did you find out about MRCI?					
What is your reason for volunteering at MRCI?					
How do you think your volunteer experience at MRCI will change your attitude about the environment or conservation?					

The section below will ask questions about your attitude and perception of the environment and conservation. Please answer truthfully, your answers will not be shared with anyone other than the investigator. Please rate how strongly you agree or disagree with the statement. If you do not understand the question that is being asked, that is ok! Just check the *I don't understand the question* box.

Please answer the statement below by circling the number that best shows how you feel about the statement being made. If you do not understand the statement please check the *I do not understand the question* box	strongly disagree	disagree	somewhat disagree	somewhat agree	agree	strongly agree	I don't understand the question
1. I feel very responsible towards protecting the environment	1	2	3	4	5	6	☐
2. Environmental destruction affects me personally	1	2	3	4	5	6	☐
3. Special habitats should be set aside for endangered species	1	2	3	4	5	6	☐
4. Special habitats should be set aside for non-endangered species	1	2	3	4	5	6	☐
5. I make a daily effort to make choices that prioritize the environment	1	2	3	4	5	6	☐
6. Destruction of the environment by humans is a huge global problem	1	2	3	4	5	6	☐
7. Deforestation in order to plant crops is ok to do	1	2	3	4	5	6	☐
8. My everyday choices do not have an impact on the environment	1	2	3	4	5	6	☐
9. Deforestation in order to make lumber and resources is ok to do	1	2	3	4	5	6	☐
10. Individual citizens need professionals to teach them how best to make sustainable lifestyle choices	1	2	3	4	5	6	☐
11. Animals that are dangerous to people should be killed or removed from where humans live	1	2	3	4	5	6	☐
12. Individuals can do a good job of protecting biodiversity on their own	1	2	3	4	5	6	☐
13. Nature is strong enough to cope with the impact of agriculture and industry	1	2	3	4	5	6	☐
14. It is more important to protect animals that provide food for people than other animals	1	2	3	4	5	6	☐
15. Most habitats in the world have been modified by humans	1	2	3	4	5	6	☐
16. Individuals can make sustainable resource choices on their own	1	2	3	4	5	6	☐
17. Professionals are the only ones who can protect biodiversity	1	2	3	4	5	6	☐

The section below will ask questions about your past experience with, and your attitude and perception of, "greener lifestyle" choices. Here, greener lifestyle choices, mean that you will make environmentally friendly and sustainable daily consumer choices. Please answer truthfully, your answers will not be shared with anyone. There are no right or wrong answers, we're just interested in your perception and attitude.

Please answer the statement below by circling the number that best shows how you feel about the statement being made. If you do not understand the statement please check the *I do not understand* box. Give a short answer where appropriate.	Strongly disagree	Disagree	Somewhat disagree	Somewhat agree	Agree	Strongly agree	I don't understand the question
1. I plan on reducing my use of energy (electricity, gas & fuel)	1	2	3	4	5	6	☐
2. I am confident I know how to make less material waste daily (plastics, packaging, consumables, etc..)	1	2	3	4	5	6	☐
3. I plan on using less water daily	1	2	3	4	5	6	☐
4. I am very comfortable living without first world amenities daily	1	2	3	4	5	6	☐
5. I will reduce, reuse and recycle more in the future	1	2	3	4	5	6	☐
6. I have lived without running water before	1	2	3	4	5	6	☐
7. I have lived without electricity before	1	2	3	4	5	6	☐
8. I will encourage others to use fewer resources daily	1	2	3	4	5	6	☐

How would you use less water each day?	
How would you reduce, reuse and recycle more each day?	
How would you encourage others to make greener lifestyle choices?	
What do you expect to learn from MRCI about more sustainable lifestyle choices?	

The section below will ask questions about your attitude and perception towards academic research and science. Please answer truthfully, your answers will not be shared with anyone and there are no right or wrong answers.

Please answer the statement below by circling the number that best shows how you feel about the statement being made. If you do not understand the statement please check the *I do not understand* box	Strongly disagree	Disagree	Somewhat disagree	Somewhat agree	Agree	Strongly agree	I don't understand the question
1. Academic publications are very important for the public to read	1	2	3	4	5	6	☐
2. Scientific research influences my personal understanding of the world	1	2	3	4	5	6	☐
3. Volunteers and nonprofessional citizens can contribute to academic research	1	2	3	4	5	6	☐
4. Scientific research is necessary in order for the public to learn how to make sustainable lifestyle choices	1	2	3	4	5	6	☐
5. I trust scientific research	1	2	3	4	5	6	☐
6. Academic publications are only important to other professional	1	2	3	4	5	6	☐
7. Scientific research is necessary in order to learn how to protect ecosystems	1	2	3	4	5	6	☐
8. Scientific research can empower me to make greener lifestyle choices	1	2	3	4	5	6	☐
9. Scientific research is not necessary to make environmental policies	1	2	3	4	5	6	☐
10. I understand the scientific method	1	2	3	4	5	6	☐
11. I would like to participate in an academic research project	1	2	3	4	5	6	☐
12. I am confident that I can collect data in an academic research project	1	2	3	4	5	6	☐

Briefly describe what you think about academic research and science:

The section below will ask questions about your attitude and perception of conservation organizations. Please answer truthfully, your answers will not be shared with anyone and there are no right or wrong answers.

Please answer the statement below by circling the number that best shows how you feel about the statement being made. If you do not understand the statement please check the *I do not understand* box	Strongly disagree	Disagree	Somewhat disagree	Somewhat agree	Agree	Strongly agree	I don't understand the question
1. One project can balance community welfare, growth, and resource development with wildlife and habitat conservation	1	2	3	4	5	6	☐
2. Governments and scientists should work with community members when creating conservation programs	1	2	3	4	5	6	☐
3. All conservation organizations should be required to work with local people when doing conservation projects	1	2	3	4	5	6	☐
4. Conservation projects run by local people will be more successful than those run by non-native people	1	2	3	4	5	6	☐
5. It is necessary for government officials and scientists to work together when planning conservation or wildlife research programs.	1	2	3	4	5	6	☐
6. Hunting and fishing by local people of endangered animals should be forbidden	1	2	3	4	5	6	☐
7. Hunting and fishing by local people of any animal in conservation priority areas should be forbidden	1	2	3	4	5	6	☐
8. In areas with few resources and high poverty levels, local people should be allowed to hunt and forage to feed their families	1	2	3	4	5	6	☐
9. It is important for every individual to be aware of environmental issues and policies	1	2	3	4	5	6	☐
10. My home government should have the right to regulate land use on private property in order to protect wildlife	1	2	3	4	5	6	☐
11. It is my responsibility to ensure that my government upholds sustainable environmental policies	1	2	3	4	5	6	☐

Appendix B – **Post-Experience Survey**

If at any point you do not understand a question, or need help reading the questions, please let the investigator know. In this survey, *sustainable* means that the rate of something being used can be maintained without destroying the environment and more is grown or produced at a faster rate than it is used.

Please answer the statement below by circling the number that best shows how you feel about the statement being made. If you do not understand the statement please check the *I do not understand* box. Give a short answer where appropriate.	Strongly disagree	Disagree	Somewhat disagree	Somewhat agree	Agree	Strongly agree	I don't understand the
1. I would you volunteer at a similar organization again in the future	1	2	3	4	5	6	☐
2. I will advocate for others to participate to participate in a similar volunteer program	1	2	3	4	5	6	☐
3. I would volunteer to work for a scientific research program regarding conservation or ecology in the future	1	2	3	4	5	6	☐
4. This was my first-time volunteering at a conservation, community outreach, or wildlife related project	1	2	3	4	5	6	☐

If you have volunteered at a similar organization in the past, please briefly describe that experience here:	
Did you complete training in one of the formal scientific research projects while at MRCI? If so, which one?	
What was the most significant part of your experience while at MRCI?	

Please answer the statement below by circling the number that best shows how you feel about the statement being made. If you do not understand the statement please check the *I do not understand the question* box	strongly disagree	disagree	somewhat disagree	somewhat agree	agree	strongly agree	I don't understand the question
1. I feel very responsible towards protecting the environment	1	2	3	4	5	6	☐
2. Environmental destruction affects me personally	1	2	3	4	5	6	☐
3. Special habitats should be set aside for endangered species	1	2	3	4	5	6	☐
4. Special habitats should be set aside for non-endangered species	1	2	3	4	5	6	☐
5. I make a daily effort to make choices that prioritize the environment	1	2	3	4	5	6	☐
6. Destruction of the environment by humans is a huge global problem	1	2	3	4	5	6	☐
7. Deforestation in order to plant crops is ok to do	1	2	3	4	5	6	☐
8. My everyday choices do not have an impact on the environment	1	2	3	4	5	6	☐
9. Deforestation in order to make lumber and resources is ok to do	1	2	3	4	5	6	☐
10. Individual citizens need professionals to teach them how best to make sustainable lifestyle choices	1	2	3	4	5	6	☐
11. Animals that are dangerous to people should be killed or removed from where humans live	1	2	3	4	5	6	☐
12. Individuals can do a good job of protecting biodiversity on their own	1	2	3	4	5	6	☐
13. Nature is strong enough to cope with the impact of agriculture and industry	1	2	3	4	5	6	☐
14. It is more important to protect animals that provide food for people than other animals	1	2	3	4	5	6	☐
15. Most habitats in the world have been modified by humans	1	2	3	4	5	6	☐
16. Individuals can make sustainable resource choices on their own	1	2	3	4	5	6	☐
17. Professionals are the only ones who can protect biodiversity	1	2	3	4	5	6	☐

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1. I plan on reducing my use of energy (electricity, gas & fuel)	1	2	3	4	5	6	☐
2. I am confident I know how to make less material waste daily (plastics, packaging, consumables, etc..)	1	2	3	4	5	6	☐
3. I plan on using less water daily	1	2	3	4	5	6	☐
4. I am very comfortable living without first world amenities daily	1	2	3	4	5	6	☐
5. I will reduce, reuse and recycle more in the future	1	2	3	4	5	6	☐
6. I have lived without running water before	1	2	3	4	5	6	☐
7. I have lived without electricity before	1	2	3	4	5	6	☐
8. I will encourage others to use fewer resources daily	1	2	3	4	5	6	☐

How would you use less water each day?	
How would you reduce, reuse and recycle more each day?	
How would you encourage others to make greener lifestyle choices?	
What do you expect to learn from MRCI about more sustainable lifestyle choices?	

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9. Scientific research is not necessary to make environmental policies	1	2	3	4	5	6	☐
10. I understand the scientific method	1	2	3	4	5	6	☐
11. I would like to participate in an academic research project	1	2	3	4	5	6	☐
12. I am confident that I can collect data in an academic research project	1	2	3	4	5	6	☐

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2. Governments and scientists should work with community members when creating conservation programs	1	2	3	4	5	6	☐
3. All conservation organizations should be required to work with local people when doing conservation projects	1	2	3	4	5	6	☐
4. Conservation projects run by local people will be more successful than those run by non-native people	1	2	3	4	5	6	☐
5. It is necessary for government officials and scientists to work together when planning conservation or wildlife research programs.	1	2	3	4	5	6	☐
6. Hunting and fishing by local people of endangered animals should be forbidden	1	2	3	4	5	6	☐
7. Hunting and fishing by local people of any animal in conservation priority areas should be forbidden	1	2	3	4	5	6	☐
8. In areas with few resources and high poverty levels, local people should be allowed to hunt and forage to feed their families	1	2	3	4	5	6	☐
9. It is important for every individual to be aware of environmental issues and policies	1	2	3	4	5	6	☐
10. My home government should have the right to regulate land use on private property in order to protect wildlife	1	2	3	4	5	6	☐
11. It is my responsibility to ensure that my government upholds sustainable environmental policies	1	2	3	4	5	6	☐