

THE COMMUNICATION OF VALUES, BELIEFS, AND NORMS IN LIVE ANIMAL
INTERPRETIVE EXPERIENCES: A COMPARATIVE CASE STUDY

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ABSTRACT

Susan Caplow: The communication of values, beliefs, and norms in live animal interpretive experiences: a comparative case study
(Under the direction of Pamela Jagger)

Environmental education (EE) is one of the most important tools available to help promote pro-environmental behavior. However, encouraging pro-environmental behavior requires more than knowledge dissemination alone; EE programs frequently contain messages intended to cultivate environmental values, beliefs, and behavioral norms because these can facilitate the uptake of pro-environmental behavior. In particular, Live Animal Interpretive Experiences (LAIEs) can help encourage these types of shifts because emotional connections with animals can expand one's sense of moral obligation to include caring for animals and the environment.

My dissertation investigates three questions about LAIEs: 1) How does the institutional context frame messages on values, beliefs, and norms, and how do educators articulate them during LAIEs? 2) What values, beliefs, and norms do participants bring to the LAIE? 3) How do learners interpret LAIEs, and what are their post-program behavioral intentions? I compare LAIEs at three facilities with different institutional values, which is a novel contribution to the field that elucidates the relationship between institutional mission and the education program design, delivery, and interpretation. My cases include a research institution, an animal rescue, and an educational facility.

I find that different types of organizations define and promote environmental values in critically different ways. Each organization follows a specialized VBN pathway that constructs meaning for the animal either as an individual, a representative of a species, or as an ambassador for an ecosystem. The scale at which the animal's value is constructed affects what kinds of threats and opportunities for individual action follow. Learners at all three sites share a generally pro-environmental profile, but learners differ across sites on some incoming values, beliefs, and norms. These differences suggest that learners may be choosing to attend different animal-themed experiences based on their personal values. Learners perceive key values-oriented messages from the institution fairly accurately, but their behavioral intentions post-program differ across sites. These differences are likely attributable to the relationship the individual has with the organization and the type of behavioral suggestions presented in the LAIEs. These findings can help educational facilities better design programs to meet institutional goals and to encourage learners to engage in pro-environmental behavior.

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LIST OF ABBREVIATIONS

CTR	Carolina Tiger Rescue
DLC	Duke Lemur Center
EE	Environmental Education
LAIE	Live Animal Interpretive Experience
NCA	North Carolina Aquarium at Pine Knoll Shores
NEP	New Ecological Paradigm
SLE	Significant Life Experiences
VCN	Value-Belief-Norm Theory

CHAPTER 1: INTRODUCTION

1.1. Overview & justification

Environmental education (EE) is one of the most important tools available to help promote pro-environmental behavior¹ (Hungerford and Volk 1990, Chawla and Cushing 2007, Monroe 2003). EE² can empower individuals to change their behavior in ways that promote sustainability and conservation³ (Eames et al. 2006). However, the adoption of pro-environmental behavior requires shifts beyond knowledge acquisition alone (Heimlich and Ardoin 2008, Schultz 2002). Value-Belief-Norm (VBN) theory posits that pro-environmental values shape beliefs that create environmentally friendly behavioral norms, compelling us to align our behavior with those norms (Stern 2000). Because EE focuses on more than just factual gains (such as the exploration of ethics, responsibility, and care), EE can also produce shifts in values, beliefs, and norms in order to promote pro-environmental behavior (Ramsey and Hungerford 2002, Turaga, Howarth and Borsuk 2010).

The use of wild animals as teaching companions in EE can help encourage the development of environmental values, beliefs, and norms (Myers and Saunders 2003). While animals have long been considered key environmental ambassadors in teaching context, I find

¹ Pro-environmental behavior according to Stern (2000) and the VBN model includes environmental activism, non-activist political behaviors, private environmentalism (such as purchasing decisions and household behavior), and behavior within environmental organizations.

² EE is a large area of inquiry including diverse programs and philosophies, but I use the most commonly cited definition outlined at the Tblisi Conference on Environmental Education.

³ I adopt the perspective of Clayton and Myers (2009) on the definition of conservation: it is not the traditional sense of resource conservation, but the conservation re-born in the 1980s to the open value-laden positions of working at the landscape/ecosystem level to promote environmentally sustainable resource management patterns.

that no term exists that explicitly refers to education programs using animals as interpretive companions. Thus, I employ the new term Live Animal Interpretive Experiences (LAIEs), which refers to when an educator (either professional or volunteer) presents an animal (or group of animals) to an audience with a verbal presentation. LAIEs can help develop affective interest, which has been shown to help learners stay with content/material longer, remember more details, and better relate the information to personal experiences (Lazarus 1991, Myers, Saunders and Bexell 2009, Webb 2000). Emotional connections with animals can also expand one's sense of moral obligation to include caring for animals (Archer and Wearing 2003). The extension of one's sense of moral responsibility to include animals can serve as a gateway to expanding personal care to other aspects of the environment (Vining 2003).

LAIEs are offered at a variety of organization types, including zoos, aquariums, nature centers, science centers, wildlife rescues, and other specialty organizations. Typically, these organizations offer LAIEs as a way to educate visitors about animals in order to meet some type of animal conservation/rights goals as part of the organization's mission (Patrick et al. 2007). Missions in these contexts matter deeply, as they reflect the ethics and goals of the organization and drive decision-making (Stone 1996). This suggests that the mission of the educational institution impacts the framing of conservation-oriented educational messages (Heimlich 2009). No previous research has been done on this institutional framing process at animal-themed organizations, yet such information is critical both to our understanding of how LAIEs can be used to meet institutional goals, and to the justification of holding animals in captivity for the purposes of education (Patrick et al. 2007). As zoos and aquariums move beyond their historic role as entertainment facilities towards entities that promote environmental care and action

(Odgen and Heimlich 2009), we need a better understanding of how these institutional shifts affect values-based conservation messages in these contexts.

Direct causality between LAIEs and individual behavioral outcomes has been difficult to demonstrate due to the complexity of the links between learning and the individual's wider experience (Chawla and Cushing 2007). Conceptualizing LAIEs as exhibiting a *shaping* influence rather than a *transformative* one facilitates deeper, more nuanced inquiries into the impacts of LAIEs on learners (Rickinson 2001). For example, programs do not typically *change* people's values; instead they help people *realize* their values (Storksdieck, Ellenbogen and Heimlich 2005). Through engaging in LAIEs, people affirm or discover what they care about, and this affirmation process affects how they conceptualize their own experiences and influences what types of experiences they seek in the future (Kahn 1999). This process of considering and realizing one's values during LAIEs is difficult to measure in the short term, but it can contribute to long-term value changes, leading to more environmentally conscious decision-making (Dietz, Fitzgerald and Shwom 2005).

A dearth of information exists about the shaping influence of LAIEs (Falk, Heimlich and Foutz 2009). We need a better understanding of how LAIEs communicate critical messages about values, beliefs, and norms; we also need to know how learners receive, interpret, and operationalize this information (Ballantyne and Packer 2009). Studying process elucidates how discrete learning experiences fit into one's existing environmental experiences and values system, which will help practitioners better design programs to meet learner needs and realize their missions more effectively. Understanding of how LAIEs impact participants is still too nascent for meaningful experimental/theoretical testing, but ideally in the future this process-

oriented data can inform experimental design to help improve program content and delivery (Heimlich 2012).

1.2. Research questions

I investigate three aspects of LAIEs, all of which address the overarching question: How does the communication of environmental values, beliefs, and behavioral norms vary across institutions with different missions? This research emphasizes the diversity within the practice of using animals in education programs. By exploring how different types of animal-themed educational experiences contribute in different ways to the development of an environmentally minded citizenry, this research can produce a more nuanced understanding of how animals help humans become more ecologically-minded, and help inform both individual and collective funding decisions.

1) Experiences from the perspective of the institution/educator:

How does the institutional context frame messages on values, beliefs, and norms, and how do educators internalize those messages and articulate them during LAIEs?

2) Experiences from the perspective of the participant:

What experiences, values, beliefs, and behavioral norms do participants bring to the LAIE?

3) The intersection of these two perspectives:

How do learners interpret LAIEs, and what are their post-program behavioral intentions?

Using a mixed-methods comparative case study design, I compare LAIEs at three facilities with different institutional values, which is a novel contribution to the field that will elucidate the relationship between institutional mission and the education program design,

delivery, and interpretation. My cases include one research institution (Duke Lemur Center), one animal rescue (Carolina Tiger Rescue), and one educational facility (North Carolina Aquarium).

My work fills gaps in EE literature and related fields: calls for more in-depth qualitative analysis (Hart and Nolan 1999), calls for a more process-oriented view (Falk, Storksdieck and Dierking 2007b), calls to learn more about the EE learner and how they interact with the material (Falk 2005, Falk et al. 2009), and calls to look at how the process of experiencing these programs impacts the learner and leads to possible behavioral outcomes (Falk et al. 2007b). Through addressing these questions, I contribute to an understanding of how LAIEs can enable (or hinder) the production of an environmentally minded citizenry.

1.3. Background

1.3.1. Conservation psychology

This research lies within the field of conservation psychology. Conservation psychology draws from a variety of disciplines in order to answer values-driven questions surrounding two main outcome areas: the encouragement of conservation behaviors and the development of care for/valuing of nature (Saunders 2003). My research contributes to knowledge accumulation in both major outcome areas of conservation psychology. Specifically, I respond to calls from conservation psychology scholars for research on how education can “reinforce values and beliefs that have a positive effect on nature and change values and beliefs that have a negative effect on nature” (Miller et al. 2004:90).

Education represents one of the key mechanisms to promote environmental care and action, the two main outcome areas of conservation psychology (Monroe 2003). LAIEs in particular can contribute by connecting visitors to animals by invoking environmental values, beliefs, and norms (Vining 2003). But where do LAIEs fit into the existing educational

literature? In the current disciplinary landscape, no field exists that is unified by a focus on animal-themed education while at the same time allowing for diverse contexts. Thus, I contend that LAIEs are informed by three related fields of inquiry: EE, nature interpretation, and free-choice learning. While activities in these areas overlap substantively, they all bring a valuable perspective to my work, and they all inform conservation psychology's two major outcome areas and drive research and best practices for LAIEs. I describe briefly how these three areas of inquiry relate to LAIEs and how my work contributes to research advancement in these fields.

1.3.2. Environmental education

LAIEs frequently employ EE strategies to promote conservation values and behaviors (Jacobson, McDuff and Monroe 2006). Out of the three areas that inform my work, EE encompasses the broadest range of theories and practices (Rickinson 2001). While EE enjoys a wide range of applications, the best-known definition comes from the Tbilisi Declaration on Environmental Education:

“EE is a process aimed at developing a world population that is aware of and concerned about the total environment and its associated problems, and which has the knowledge, attitudes, motivations, commitments, and skills to work individually and collectively toward solutions of current problems and the prevention of new ones.” (Tbilisi Declaration, UNESCO 1977)

According to this definition, EE can be much more than education on environmental topics. EE can also aim to produce environmentally/socially aware and action-oriented citizens by encouraging learners to identify problems, make decisions, and take steps to mitigate a problem (Eames et al. 2006, Barrett 2006, Hungerford and Volk 1990). While cognitive gains from exposure to EE have been extensively demonstrated through quantitative research, the ways in which EE shapes incidental or broader outcomes (including the shaping of environmental values) have been under-researched (Hart and Nolan 1999, Rickinson 2001, Storksdieck et al. 2005). Additionally, EE has been criticized for acknowledging the importance of outcomes beyond

knowledge acquisition but failing to incorporate these other goals meaningfully into programming (Saylan and Blumstein 2011, Scott 2009).

In my project, EE provides a helpful overarching structure by framing education as a tool to promote the development of environmental values, beliefs, and norms. However, EE is so broad that it does not specify the settings or the subjects of the EE program, whereas LAIEs in my study are specifically defined as educator-led interpretive programs featuring a wild animal as a teaching companion.

1.3.3. Nature interpretation

Nature interpretation best captures the structure of the LAIEs at my field sites. The National Association for Interpretation (NAI) defines interpretation as “a communication process that forges emotional and intellectual connections between the interests of the audience and the inherent meanings of the resource” (Knapp and Benton 2004). Specifically, my focal LAIEs are all “personal interpretation,” meaning that an in-person guide delivers an educational program to a live audience, as opposed to interpretive signage or other pre-recorded interpretation (Brochu and Merriman 2002). Interpretative guidelines encourage educators to focus on making the interpretive object “come alive” by concentrating on its wonder, beauty, and deeper meaning for the audience (Tildman 1957).

Nature interpretation research also adds value to my work because it emphasizes emotions, something that traditional educational evaluation typically ignores (Webb 2000). Emotions and personal meaning-making (both central to interpretive theory) are under-researched in EE and interpretive literature (Archer and Wearing 2003, Rickinson 2001). Interpretation has also been shown to lead to better knowledge retention than facts-only presentations (Visser, Snider and Stoep 2009).

The third way interpretive theory informs my work is by emphasizing the importance of program design. Content revolving around a focal theme is considered best practices in interpretation, and the program also must be enjoyable, relevant to the learner, and well-organized (Ham 2007, Beck and Cable 2002, Knapp and Benton 2004). Best practices in nature interpretation have been recently analyzed at a large scale within the National Park Service and were found to contribute positively to both visitor satisfaction and behavioral intentions post-program (Stern et al. 2012). If educators establish clear themes in the LAIEs I study, I can better isolate elements of VBN as they relate to key LAIE content and compare programs across sites.

1.3.4. Free-choice learning

Even though LAIEs are structured programs, LAIEs frequently occur within free-choice learning contexts (Clayton and Myers 2009). While the specific borders of learning environments are debatable, free-choice learning is most constantly considered to occur outside of the formal schooling environment (Ballantyne and Packer 2005). Settings associated with free-choice learning include museums, science centers, zoos, aquariums, botanical gardens, and nature centers among others (Falk and Dierking 2002). Free-choice learning is self-paced, non-sequential, voluntary, and driven by identity-related needs and creating a personal sense of value within the world (Falk and Storksdieck 2010, Falk 2005). Free-choice learning scholars have contributed to a much better understanding of *who* the visitors are in terms of their incoming knowledge and goals for the program (Falk et al. 2007b, Falk and Adelman 2003). However, despite gains in learner profiling, variation and complexity within the individual experience persists (Heimlich 2012). Thus, the call remains to study the impact of interventions on the individual learners and to relate these impacts to desired sustainability outcomes (Ballantyne and

Packer 2005). Free-choice learning research also informs my work by emphasizing contextual factors, which include institutional mission, my key variable of interest.

Free-choice learning research has shown that a higher proportion of free-choice learners are white, liberal, female, and highly educated than the general population (Falk et al. 2009). These same demographic groups have shown to be more ecologically minded than the average population as well (Nooney et al. 2003). This fact has led to the criticism that these programs “preach to the choir” (Storksdieck et al. 2005). However, scholars argue that preaching to the choir can reinforce pre-existing values, beliefs, and norms, which is also a positive learning outcome (Ellenbogen 2003). This reinforcement can help move individuals towards new decisions to take action for the environment (Falk 2005).

Within free-choice learning, a subset of work focuses specifically on zoo and aquarium learning (Falk et al. 2007a). Zoos and aquariums have been increasingly called upon to justify the keeping of animals based on the importance of education and conservation efforts in these settings (Hutchins, Smith and Allard 2003), which has led many institutions to rewrite their missions with a more explicit focus on conservation work (Hutchins et al. 2003, Miller et al. 2004, Patrick et al. 2007). However, even though zoo and aquarium characteristics overlap substantively with my field sites (in that they house animals for the purposes of education, conservation, research, etc.), the specialty organizations I selected for my cases do not qualify as a zoo or aquarium, and are excluded from comparative studies featuring animal-themed education. Thus, I situate my work in a broader framework including several fields of inquiry in order to better capture the unique settings in which I study LAIEs.

Though some research suggests that there is a “typical” free choice learner, some research suggests that zoos and aquariums may attract a more diverse audience than previously

thought (Khalil and Ardoin 2011). Thus, animal-themed facilities are well-positioned to deliver environmental messages beyond the choir. Also, while animal-themed entertainment is widely popular, visitors are becoming increasingly uncomfortable with institutions keeping animals for human purposes (Knight and Herzog 2009). Many animal-themed facilities have responded by making efforts to focus on conservation and other goals beyond entertainment, providing justification for their captive populations (Hutchins et al. 2003, Miller et al. 2004). This shift towards a need for justification opens niches for different types of animal-themed facilities, which could serve the function of appealing to different audiences. Understanding differences between audiences at different types of facilities can help redefine the choir as a more diverse and nuanced group, much like work in community-based conservation has broken up the concept of the “community” (Agrawal and Gibson 1999).

Learners in these types of contexts will always be diverse along various gradients, meaning that no education program can perfectly accommodate all learners. However, tailoring messages to audiences can help facilitate behavior change among other shifts in environmental values, beliefs, and norms (McKenzie-Mohr and Smith 1999, Monroe 2003). Well-designed education programs accommodate the learner’s previous experiences and build on them in a meaningful way.

In practice, all three of these areas of inquiry overlap substantively, but they all contribute a unique and valuable perspective to this work. Environmental education defines the content of the programs as they target environmental knowledge, beliefs, values, and so forth. Nature interpretation defines the education program format in these settings, which involves an educator interpreting a resource. Free-choice learning environments encompass the facilities under

examination, and much of the research on the audiences in these types of settings has been conducted under the free-choice heading.

1.3.5. Research gaps

Falk and his colleagues (2007a) best summarize the synergistic research gaps in these three fields as they relate to LAIEs. As part of a multi-year, multi-institutional NSF-funded study, they conducted an extensive literature review on learning in zoos and aquariums and found that most research focused on perceptions of animals and not on conservation messages. This finding is problematic considering most of the institutions promote conservation as part of their mission. Also, very few studies have been conducted on visitor conservation knowledge, affect, or behavior, nor has this work been studied across sites or contexts (Dierking et al. 2002). They argued that a substantive knowledge gap exists for five overarching questions:

1. *How do aquariums and zoos contribute to people's understanding and perceptions of animals and their conservation?*
2. *How do aquariums and zoos contribute to people's personal and emotional connections to animals and their conservation?*
3. *How do zoos and aquariums contribute to the ways people act and behave towards animals?*
4. *How do we increase these impacts? What do we do that is successful?*
5. *Who are our visitors?* (Falk et al. 2007a: 5-6)

Their study addressed these gaps in self-guided experiences at zoos and aquariums, but two key variations on their questions remain. First, they did not examine structured LAIEs, which provide more opportunity to control the learner experience. Structured LAIEs might also attract fundamentally different participants with different motivations and experiences than free-choice learning participants. Second, they did not explore these questions in regards to animal programs outside of a zoo/aquarium context, where mission and institutional values differ substantively. According to Jeavons (1992), values drive non-profit organizations. All three of the organizations I have selected have made a commitment to care for animals and the

environment, but the “moral commitment” of each one differs based on the institutional mission (Schervish and Ostrander 1990). I postulate that these different types of organizations fill fundamentally different niches in the promotion and definition of environmental values, and that these differences must be understood to better know how messages from different types of institutions interact with the learner. Thus, my field site selection includes one AZA⁴-accredited institution (North Carolina Aquarium), one research facility (Duke Lemur Center), and one wildlife sanctuary (Carolina Tiger Rescue).

I also explore potentially negative outcomes for the environment or animal welfare. LAIEs have the potential to trigger both negative reactions (such an aversion to animal captivity) and negative outcomes (anthropomorphication of the animal, anthropocentric thinking, commodification of nature, desiring a wild animal as a pet, etc.) (Clayton and Myers 2009, Reade and Waran 1996). Most research questions in EE and related fields focus on positive gains in education, but acknowledging these potentially negative outcomes allows for a more nuanced and balanced understanding of the interactions between program messages and learner outcomes.

1.4. Theory

1.4.1. Value-belief-norm theory

A variety of competing theories conceptualize how individuals become engaged in environmentally responsible behavior (See Jacobson et al. 2006 for a comprehensive list). I selected the value-belief-norm (VBN) theory by Stern and Dietz (Stern et al. 1999) to operationalize complex ideas like values and beliefs. VBN is the best framework for my analysis because it explicitly includes values, which are central to my research gap (Figure 1.1). VBN

⁴ The Association of Zoos and Aquariums is the premier institution providing accreditation to facilities meeting standards in animal care and education (www.aza.org).

follows a similar structure to other competing theories⁵, starting with deeply personal/stable environmental values and moving to understanding consequences, recognizing accountability and responsibility, and then finally to taking action on behalf of the environment (Chawla and Cushing 2007, Hungerford and Volk 1990). Regression analysis has shown support for the idea that VBN provides “the best available social-psychological account of non-activist support for the goals of the environmental movement” (Stern et al. 1999: 91). In-depth qualitative work has also shown that values are tightly linked with environmental concern (Kempton, Boster and Hartley 1995).

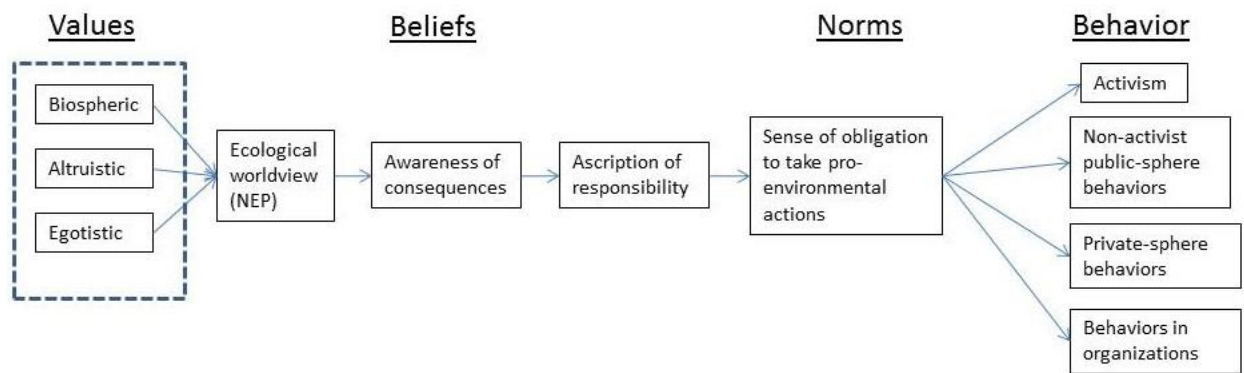


Figure 1.1. VBN model, from Stern (2000).

According to the model, values represent the zero-order variable on a causal chain ending in pro-environmental behavior (Stern, Dietz and Guagnano 1995). The definition of values varies substantively by context, but in this case, values includes five key features: “a (1) belief (2) pertaining to desirable end states or modes of conduct, that (3) transcends specific situations, (4) guides selection or evaluation of behavior, people, and events, and (5) is ordered by importance relative to other values to form a system of value priorities” (Schwartz 1994: 20). Empirical research supports the theory that biospheric, altruistic, and egotistic values orientations influence

⁵ Hines, Hungerford and Volk’s model of environmentally-responsible citizenship provides the closest parallel to VBN, but VBN is considered by some to be an update of the former theory (Chawla and Cushing 2007).

the development of an ecologically minded worldview and engagement in environmentally responsible behavior (Dietz et al. 2005). Biospheric values invoke the intrinsic value of nature, altruistic values frame nature as benefitting humankind, and egotistic values are the self-fulfilling aspects of environmentalism (self-actualization, feeling needed, etc.) (Stern 2000). In all three cases, the valued *object* is the environment/nature, but the underlying justification for that value differs. Scholars have debated about the dimensionality of these values, as some scholars have argued that the divide is between ecocentric and anthropocentric values only, whereas others have found evidence for these three factors (Milfont and Duckitt 2004). In either case, the egocentric dimension has had the most inconsistent relationship to environmental behavior, leading scholars to conclude that when egotistic values are evoked, contextual factors may be more influential in behavioral decision-making than underlying values (de Groot and Steg 2010, Schultz et al. 2005).

Values lie at the beginning of the causal chain because they develop relatively early in life, remain relatively stable, and because they act as a filter for information pertaining to variables further down on the causal chain (Stern et al. 1995). While values in this framework are quite abstract, they are frequently operationalized around a “valued object,” which in my case is the animals in the LAIEs; the reason the animals are valued would be for either the individual, humankind, or the biosphere (Stern et al. 1999). Values are also conceived of as a “guiding principle for selecting or evaluating behavior, people, and events” (de Groot and Steg 2008: 331), which again places values at the beginning of a causal change that ends in more targeted actions.

Beliefs in this context are “part of a system that includes our values and attitude, plus our personal knowledge, experiences, opinions, prejudices, morals, and other interpretive perceptions

of the social world” (Saldana 2009: 89). While this definition is quite broad, three specific types of beliefs populate the VBN model: ecological worldview, awareness of consequences, and ascription of responsibility.

Worldviews encompass core values, beliefs, and understanding of the world (Storcksdieck et al. 2005). The New Ecological Paradigm (formerly New Environmental Paradigm) includes belief in ecological limits, the need for balance in nature, the inappropriateness of human domination narratives, and fear of ecological catastrophe (Dunlap et al. 2000). The New Ecological Paradigm worldview emerged in contrast to the Dominant Social Paradigm, which in contrast favors individualism, materialism, economic growth, and the concept of progress (Albrecht et al. 1982, Dunlap and Van Liere 1978). The New Ecological Paradigm Scale has been used to measure environmental beliefs in diverse populations (see Hawcroft and Milfont 2010 for a meta-analysis), and while other measurement tools exist, the NEP Scale has been the most widely used metric for overarching environmental beliefs of the last 30 years (Stern et al. 1995, Hawcroft and Milfont 2010).

The next three variables in the chain are derived from the norm-activation theory by Schwartz (1977). In this theory, pro-environmental behavior is triggered when an individual sees a consequence for environmental problems and also sees actions they could engage in to mitigate that threat (Stern et al. 1999). Awareness of consequences and ascription of responsibility also correspond with the concept of Action Competence in EE. One develops Action Competence by gaining knowledge of a problem, demonstrating commitment to solving it, generating a vision of how to do so, and cultivating the tools to act (Jensen and Schnack 1997). In other words, people need to perceive a problem and to see themselves as a capable agent to mitigate the problem (Eden 1993).

Norms represent social and personal motivators and prescriptions for behavior that direct change to some specific outcomes. Norms are the “ought-to’s” of the model, and these form in response to the articulation of one’s values in a given social context (Dietz et al. 2005). The sociocultural view of learning emphasizes the importance of norms because it defines learning in terms of the dialogue we engage in with our communities (Falk 2005). As the closest variable to behavior in the VBN chain, norms theoretically have the most direct influence on behavior, but contextual factors and other variables make this relationship difficult to predict (Stern 2000).

Kollmuss and Agyeman provide a succinct overarching definition of pro-environmental behavior as “behavior that consciously seeks to minimize the negative impact of one’s actions on the natural and built world” (Kollmuss and Agyeman 2002: 240). Ideally, pro-environmental behavior results from the development of environmental values, beliefs, and norms. Like the variables preceding it, behavior is a complex construct, and environmental activities are usually comprised of multiple behaviors, each of which might have separate influences (McKenzie-Mohr and Smith 1999). In the VBN framework, pro-environmental behaviors are divided into four categories: activism (actively participating in environmental initiatives), non-activist public-sphere behaviors (joining an organization, voting, etc.), private-sphere behaviors (buying green products, recycling, etc.), and behavior in organizations (as part of professional obligations) (Stern 2000). I consider all of these variables in my data collection, as educators at all three sites could promote any type of pro-environmental behavior in their programs.

While all of the other variables in the model have been shown to be important in some cases, no one factor has emerged as the most important predictor of behavior change (Corral-Verdugo 1997, Corbett 2005). In Gardner and Stern’s (1996) seminal book on environment and behavior, the authors argue that many of the intuitive assumptions about human behavior are

wrong, namely that our problems can be blamed on selfishness, western values, scientific progress, misperceptions of risk, or a lack of education on environmental issues. In reality, human behavior is subject to many irrational and often subconscious influences (Clayton and Myers 2009). Understanding the relationships between these variables despite significant confounding influences remains a challenging yet critical task, but what the framework makes clear is that attention to a variety of psycho-social factors is necessary in order to understand and subsequently facilitate behavior change.

Scholars often use VBN theory to explain pro-environmental behavior in the absence of intervention, but environmental education has been cited as an important tool for shifting the variables along the chain in order to promote pro-environmental behavior (Chawla and Cushing 2007, Monroe 2003). VBN has even been used with some success to design education interventions with behavioral change goals (Turaga, Howarth and Borsuk 2014). For my analysis, I examine how VBN messages are expressed by the institution, educators, and learners. Through this process, I compare how the process of formulating VBN messages in each context differs based on the institutional mission, shedding light on how institutional settings drive educational content and how VBN messages are received by different audiences. While it is likely that no framework is sufficiently complex so as to capture the factors that determine pro-environmental behavior (Kollmus and Agyeman 2002), the VBN framework is sufficiently explicit about key correlates with behavior so as to provide helpful structure for these complex processes.

1.4.2. Limitations to the VBN framework

Causality between short-term educational initiatives and changes in broad measures of values, beliefs, etc. has proven difficult to establish. Determinants of learner outcomes are so

complex, they afford little opportunity to measure interventions or behavior in isolation (Heimlich and Ardoin 2008). Most importantly, behavior is determined by a variety of contextual factors, including both environmental limitations (as in, a behavior might not be physically possible for an individual) and internal limitations (environmental behaviors are comprised of many individual habits and decisions, some of which may or may not be conscious) (Heimlich and Ardoin 2008). While I do not test causality empirically, I consider causality from the learner perspective. People take up pro-environmental behaviors for many reasons other than the environment (e.g., convenience, frugality) (De Young 2000). However, if participants believe environmental concern/care fostered by an educational experience drives their behavior, this information can help improve the practice of promoting pro-environmental behavior, even if other motives also influence their behavior.

Causality between individual behavior and environmental improvement is also difficult to establish due to the complexity of the relationship between the individual and his/her environment. One way to deal with this issue is to measure behavior (self-reported or observed) and relate it to existing literature on the relative impacts of various behaviors on environmental outcomes (Brower and Leon 1999). Because I cannot measure direct impacts on the environment or behavior itself, I again focus more heavily on sustainability from the actor's perspective in my data collection. I then relate their reported behavioral outcomes to existing literature on environmental sustainability as part of my analysis.

1.4.3. Learning theories

Three theories inform my understanding of the process of learning: the contextual model of learning, adult learning theory, and significant life experiences theory. These theories frame the interactions between the learning process and the variables in the VBN framework. All three

conceptualize the learning process as context-specific, social, and complex. They also place substantive value on the experiences, ideas, and beliefs that learners bring to an LAIE. However, each one provides a particular perspective that informs my work.

The contextual model of learning by Falk and Dierking (2000) provides the most appropriate overview of the process of how LAIEs impact the individual learner. This model defines learning as a contextually driven effort to create meaning and engage in dialogue with surroundings (Falk and Storksdieck 2005). Learning is non-linear, unpredictable, and idiosyncratic, and it depends on a host of contextual factors like social interactions, temperature, fatigue, lighting, personality type, motivations, and other issues (Falk 2005). These factors all have the potential to enable or hinder learning. My research casts the institutional context as a critical component of the learning process, so this theory helps justify my research questions.

Adult learning theory frames LAIEs as potentially transformative experiences. This theory describes adult learning as voluntary, learner-oriented, building on past experience, and fueled by intrinsic motives (Jacobson et al. 2006). Most adult learning involves justifying current positions or validating communicated ideas, but transformative experiences arise when participants reflect upon and reassess underlying premises in their values and identities (Eames et al. 2006, Mezirow 1991). This process of transformation as a result of experiencing an LAIE can serve as an important catalyst for shifts in values, beliefs, norms, and behaviors. Even in the majority of cases, where a large transformation does not occur, this theory calls attention to the process of reinforcing pre-existing ideas, which is an important learning process as well (Storksdieck et al. 2005, Bush-Gibson and Rinfret 2010).

Significant Life Experiences (SLE) theory gives voice to the historical/narrative perspective in the learning process (Tanner 1980). SLE theory posits that people experience

significant events throughout their lives that facilitate certain outcomes and aid in the development of a cohesive life narrative (Chawla 1998b). Existing literature on SLE illustrates that experiences with wild places and adult mentors help develop environmentalist identities (Chawla 1999). The evidence also suggests that repeated interactions with wild nature, animals, and educational content augment SLEs and can be transformative in and of themselves (Bixler, James and Vadala 2011). SLE theory emphasizes how both affective and cognitive experiences interact with a lifetime narrative of environmental thought (Cachelin, Paisley and Blanchard 2008). SLE also highlights the relative heterogeneity of learners, calling for research that is more sensitive to pre-existing identities and values (Ballantyne and Packer 2005). This theory has been used primarily to study environmental professionals/activists (Tanner 1998), more research is needed examining how life experiences foster pro-environmental behavior in the wider population (Stevenson et al. 2014). I use SLE prominently in my second results chapter in which I explore previous experiences of LAIE participants.

1.4.4. Summary of background and theory

All of the fields, theories, and frameworks outlined in this section contribute to the communication of values, beliefs, and norms in live animal interpretive experiences. The three fields of inquiry (EE, nature interpretation, and free-choice learning) provide the context, structure, and goals of the LAIEs. VBN theory describes the process of how an individual engages in pro-environmental behavior as well as the ways in which an educator could address an individual to attempt to facilitate behavior change. Finally, the three learning theories frame the individual-level process of how interactions with educational content can challenge or reinforce one's existing values, beliefs, and norms. Together, these fields provide structure for the LAIE context, process, and outcomes.

1.5. Significance of this work

Framing education programs as a complex, nuanced conversation with the learner's pre-existing characteristics, experiences, and beliefs is a critical component of understanding how educational experiences shape people over time. Understanding these processes across contexts will improve both the internal validity of my results as well as its generalizability. Ideally, my findings can inform future research using quasi-experimental design to help improve program content and delivery in order to better achieve institutional conservation-themed goals (Heimlich 2010).

The information generated by this type of framing can not only help individual institutions improve the design of their programs to better meet the learner's needs, but also shed light on relationships between the educational efforts of different institutions, potentially enabling organizations with similar goals to collaborate on values-based messaging strategies to improve message consistency between sites. I also illuminate how contextual differences might relate to the potential for transformative experiences so that education programs can operate most effectively within their given institutional context.

This work fosters a more nuanced understanding of how animals are used in educational programs. As opposed to arguing that using captive animals in education is either a good or a bad practice, I examine how animals are perceived in different contexts and whether learners in those contexts are feeling motivated to take action on behalf of the environment. This information can inform decisions about which types of institutions should receive public support, as some types of organizations might be more effective at encouraging pro-environmental behavior.

I also explore the unique role of animals in facilitating the development of environmental values, beliefs, norms, and behavior. I consider how each organization frames and uses animals

as ambassadors for VBN messaging, including the possibility of both positive and negative influences of LAIEs on learners and the environment. Assessing the ways in which animals are used for educational purposes contributes to the debate about the justification of using animals for educational (or other human-focused) purposes (Hutchins et al. 2003, Oakley et al. 2010). The burden of proof is growing for facilities housing captive animals to demonstrate how this practice is contributing to positive social and environmental change.

In sum, this work contributes to a better understanding of how environmental education professionals can design interventions to compel humans to engage in environmentally responsible behavior, which can in turn help policy-makers achieve conservation goals. This work is relevant to scholars and practitioners in any field in which they work to facilitate behavior change and foster care for/appreciation of natural resources and the environment.

1.6. Dissertation structure

This work is organized in a modified three-paper format. This chapter provides background for the entire project, and the second chapter describes the design and methods. The third, fourth, and fifth chapters present a results narrative that moves from the institution through the educator to the learner and finally to learner outcomes. Chapter 3 tracks VBN messaging as it moves from the institutional context through the educators to the LAIEs. Chapter 4 details the learners in terms of their incoming values, beliefs, and experiences. Finally, Chapter 5 explores how learner react to and interpret VBN messages and brings the research full circle by incorporating insights about the institutions and the learners from the previous two results chapters. Chapter 6 provides a synthesis of the three results chapters.

CHAPTER 2. STUDY DESIGN & METHODS

2.1. Design overview

In order to effectively combine qualitative and quantitative approaches, I adopt a pragmatic epistemological and ontological framework in my work. A pragmatic stance combines elements of positivism and constructivism (Pawson and Tilley 1997). Pragmatism is a form of postpositivism, in which the researcher believes that phenomena can be measured objectively, but the limitations of our ability to capture an objective “reality” are acknowledged (Guba and Lincoln 1998). Pragmatism recognizes that quantitative and qualitative research exemplify different styles of the same process of inference-making using imperfect theories, research designs, and data (King, Keohane and Verba 1994).

This project is a mixed-methods comparative case study with an exploratory design (Creswell and Clark 2007). Case studies explore phenomenon in-depth and in-context (Yin 2009). Case study methods are the most appropriate when one’s research agenda focuses on “how” questions and when the researcher has little control over the phenomena in question (Yin 2009). Exploratory design is a particular form of mixed-methods research which involves first collecting qualitative data (“exploring” the topic) and then implementing further data collection in order to test for distribution and prevalence of themes (Creswell and Clark 2007). This method is appropriate and useful when a preliminary understanding of the phenomena at hand is needed before larger-scale data collection occurs. In my case, I collected a first round of data in the summer of 2012, and this data informed the second round of data collection in the summer of 2013. Finally, comparative case study improves the robustness of my findings (Herriott and

Firestone 1983). Comparing multiple cases sheds light on how the characteristics of each organization and programs interact with the learner experience and outcomes.

2.2. Site selection

I conducted my case study work at three field sites, each representing one case. I selected “maximum variant” cases, in which each case differs along a key variable theorized to play a particularly important role in process and outcomes (Flyvbjerg 2006). In my study, institutional mission/values represent the key variable. More specifically, these three particular organizations provide a meaningful comparison because they all have conservation and education goals, which effectively serve as the outcomes for my project (education is the treatment and conservation is the message), yet they also have additional, more specific institutional contexts that shape how they present educational messages. They are similar on other key metrics: they all offer direct experiences with charismatic megafauna, they all work under the broad mission of animal conservation, they are all in North Carolina, and they all offer reservations-only guided tours lasting 45 minutes to 2 hours. These similarities enable rich comparison across sites. I also limited my analysis to highly reputable organizations, as I did not want reputational issues to interfere with my analysis. Thus, each facility has an affiliation or accreditation that lends them considerable credibility: Carolina Tiger Rescue is a federally recognized wildlife sanctuary as defined by the Captive Wildlife Safety Act (CTR 2014), the North Carolina Aquarium is a member of the Association of Zoos and Aquariums (AZA), and the Duke Lemur Center is affiliated with Duke University.

These three cases also differ on several other characteristics (Table 2.1), but these characteristics correlate with institutional mission/values to the point that eliminating these differences would have proved impossible. For example, one is unlikely to find a large, state-run

lemur rescue. In fact, the animal species are so tightly intertwined with the mission, the animals are effectively part of the mission itself. In other words, these organizations are built around the societal framing and value of the animals they care for, and the framing of the animal plays an important role in the communication of values, beliefs, and norms in LAIEs.

Despite the differences in taxonomical groups at each facility, the animals share some key similarities. Most notably, each site has at least one *flagship species*, a species that is used as a symbol and motivator for conservation action (Caro et al. 2004). Flagships are selected for their charisma and societal relevance, and an analysis by Czech and colleagues (1998) showed that mammals, fish, and Testudines (turtles) enjoy high levels of political support and positive social construction. These flagship species are also considered to be important conservation targets in their own right. Tigers are listed endangered on the IUCN Red list, and three of the nine subspecies have already gone extinct (IUCN 2014). Tigers carry both cultural and ecological value as an apex predator (GTI 2014). Tigers were declared to be the most well-loved animal on the planet in an informal yet wide-reaching poll (MEN 2004). Lemurs are considered to be the world's most endangered primates (IUCN 2014), and as inhabitants of Madagascar (their only native range), they have evolved into dozens of species that fill numerous ecological niches and maintain vital ecosystem services on the island (Martin 1972). Sea turtles have ecological, cultural, and tourism value, and are considered to be an exceptionally charismatic and well-loved reptile (WWF 2014). Viewing aquatic animals can be a tranquil experience for guests, and visitors also connect to aquatic species as resources of great economic value (Sanchirico and Emerson 2002).

Table 2.1. Field sites

	Carolina Tiger Rescue	Duke Lemur Center	NC Aquarium
Mission statement	“Saving and protecting wild cats in captivity and in the wild”	“Promote research and understanding of prosimians and their natural habitat as a means of advancing the frontiers of knowledge, to contribute to the educational development of future leaders in international scholarship and conservation and to enhance the human condition by stimulating intellectual growth and sustaining global biodiversity”	“Inspiring appreciation and conservation of North Carolina’s Aquatic Environments”
Management	Independent non-profit	University affiliate	State
Type of animals	Carnivores (domestic and exotic)	Lemurs (exotic)	Marine (domestic)
Location	Pittsboro, NC	Durham, NC	Pine Knoll Shores, NC
Educational offerings	Guided programs only	Guided programs only	Guided programs and unstructured visits
Megafauna Charisma	High	High	High
Wild status of flagship animal (IUCN)	Endangered, 3 of 9 Tiger subspecies extinct	World’s most endangered primates	4 of 7 of sea turtle species endangered or threatened

2.2.2. Field sites

Carolina Tiger Rescue

Carolina Tiger Rescue (CTR) was founded in the early 1980s as a breeding facility for rare carnivores (called Carnivore Preservation Trust). In 2001 they ceased their breeding programs in favor of wild cat rescue. Their mission is “saving and protecting wild cats in captivity and in the wild.” (CTR 2012). While their new name speaks to their tiger population, they house approximately 60-70 animals including tigers, lions, bobcats, leopards, ocelots, kinkajous, binturongs, cougars, servals, and caracals. They offer public tours run mostly on the weekends by volunteers and do not allow individuals to enter the sanctuary unaccompanied.

Duke Lemur Center

Duke Lemur Center (DLC) was founded in 1966 as a collaboration between two professors, one at Duke and one at Yale. DLC was originally a research facility and only recently has become more publicly visible. They house approximately 250 prosimian (pre-monkey) primates from 21 species, and DLC’s collection is the largest population of lemurs outside of Madagascar in the world. DLC’s mission is, “Promote research and understanding of prosimians and their natural habitat as a means of advancing the frontiers of knowledge, to contribute to the educational development of future leaders in international scholarship and conservation and to enhance the human condition by stimulating intellectual growth and sustaining global biodiversity” (DLC 2012). DLC conducts research, breeds lemurs for conservation, offers guided education programs, and engages in in-situ conservation efforts in Madagascar.

North Carolina Aquarium

The North Carolina Aquarium at Pine Knoll Shores (NCA) was founded in 1976 as a teacher resource center. Over time, they have shifted their attention to displaying animals for

public education, and in 2006 they opened a 90,000 square-foot facility that houses the largest tank in North Carolina at 306,000 gallons. They only keep NC-native species, and their galleries are organized by the theme of “mountains to sea.” Their mission is, “inspiring appreciation and conservation of North Carolina’s Aquatic Environments” (NCA 2012), and almost all of their work focuses on education. NCA’s main in-situ conservation activity efforts are a local sea turtle rescue-and-release program, but while the turtles are housed at NCA they are used in education programs. NCA is the only facility in my study that allows the public to visit without a guide, but they also offer specialty tours that take visitors behind the scenes; these require an additional fee and a guide, making them similar to the programs at CTR and DLC in structure.

2.3. Methods

My dissertation investigates three aspects of LAIEs, all of which address the overarching question: How does the communication of environmental values, beliefs, and behavioral norms related to conservation vary across institutions with different missions? In order to answer this question, I follow how the institutional context frames messages on environmental values, beliefs, and norms, and how those messages are then internalized and articulated by educators, and how audiences make meaning of these messages from their incoming experiences and ideas. The conceptual map in Figure 2.1 depicts how the key concepts in this framework relate to data sources, and I explain each part in more detail as I describe my objectives and methods for each individual research question.

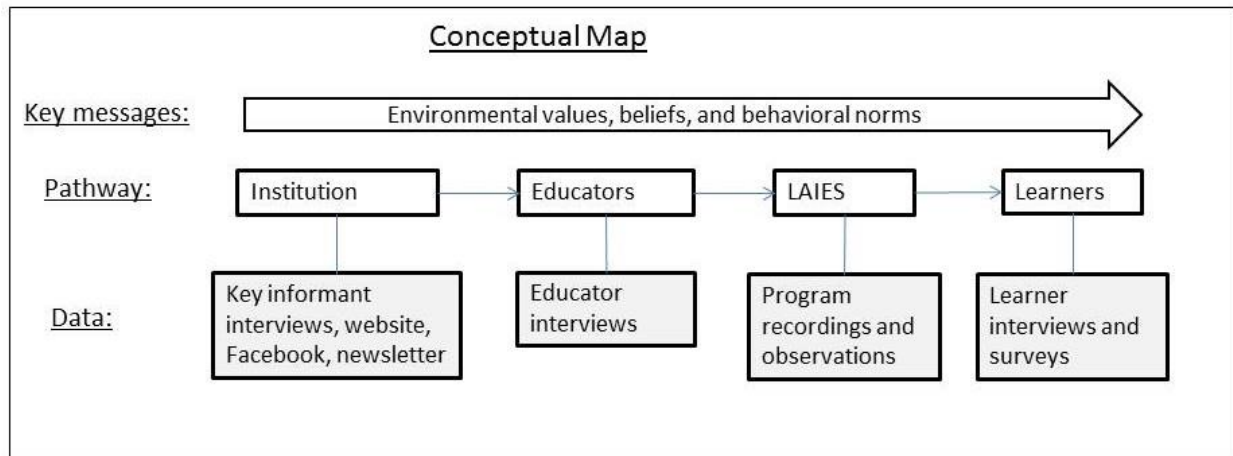


Figure 2.1: Conceptual map displaying relationships between constructs and data.

2.3.1. Methods & data for RQ1

My first research question explores experiences from the perspective of the institution/educator: How does the institutional context frame messages on values, beliefs, and norms, and how do educators internalize those messages and articulate them during LAIEs? To answer this question, I use data from the institution, the educator, and the LAIEs to understand how VBN messaging moves through this communication pathway (Table 2.2).

Table 2.2: Objectives and data for RQ1

Objectives	Data type
a) Analyze how key institutional representatives and written materials present the mission of the organization and the goals of the educational programs.	Institutional data
b) Explore educator intentions and how those relate to the organizational mission.	Educator data
c) Identify messages presented as most important or urgent	LAIE data
d) Uncover how VBN-related messages are communicated during LAIEs.	

Institutional Data

I conducted three key informant interviews at each site (Table 2.3). This gave me an overarching perspective on the institution and the values and mission of the organization, as well

as any changes the organization has gone through over time. At each site I interviewed the Director/CEO, the Director of Education, and one other person based on recommendations from my first two interviewees. See Appendix A for key informant interview guide.

I also collected materials produced by each organization, including information from the organizations' websites, Facebook page feeds, and newsletters. These materials display the image each organization wishes to put out to the world – these are most tightly controlled by the organization and thus provide the best window into the institutional styling of each facility. I analyzed all institutional materials produced between the first day of my fieldwork and the last day (June 28, 2012-August 22, 2013). Their Facebook feeds in particular offer a unique comparative opportunity, as Facebook represents a relatively consistent format. The three organizations use Facebook with similar frequency: during my study period, DLC and CTR each posted 94 times, and NCA published 102 posts during the same time period.

Table 2.3: LAIE and institutional interview totals by site

	CTR	DLC	NCA	Total
Key informants	3	3	3	9
Educators	9	8	13	30
LAIEs	25	37	41	103
Total	37	48	57	142

Educator Data

I conducted 30 interviews with the volunteers/staff conducting the LAIEs. In these interviews, we discussed the educator's personal history, motivations, and goals for their education programs. See Appendix B for my interview guide with educators. I used the Significant Life Experiences (SLE) framework to examine the pathways educators take to arrive at their current level of commitment to animal conservation (Chawla 1999, Chawla 1998b).

My LAIE sample was somewhat random, as I could not control the LAIE schedule. However, I attempted to capture an educator pool reflective of the tenure distribution at each site

(i.e. volunteer, permanent staff, or intern/seasonal staff). Thus, at CTR, my sample was almost all volunteers, at DLC I observed a mix of staff and volunteers, and at NCA I observed all staff⁶. In Chapter 3, I discuss in more detail the differences between using staff and volunteer educators.

Table 2.4: Observed educator sample by site, 2012/2013 combined.

	CTR	DLC	NCA
Permanent staff	2	3	4
Seasonal/interns	0	3	7
Volunteers	17	10	0
Total	19	16	11
% present both summers	89%	50%	36%
Average # LAIEs per educator	1.4	2.4	4.2

In order to have limited data on temporal change I interviewed at least one educator both in 2012 and 2013 from each site. All of the educators in my interview sample were recorded at least once conducting an LAIE, and the largest amount of recordings for one educator was 12 in the case of one educator at NCA. I collected the fewest recordings per educator at CTR, followed by DLC, and finally NCA (Table 2.4).

LAIE Data

I conducted participant observation of public programs at all three sites. For this study, participant observation involves both participating in the activities being observed and observing others engaging in the activity alongside the researcher (Spradley 1980). This process allows the researcher to observe others reactions and to produce a first-hand account of the experience.

During the summer of 2012 I attended a minimum of seven programs at each facility, capturing at least six of the “standard” program in each case and attending at least one of the “in-depth” programs at each one. During the 2013 season, I limited my analysis to the standard

⁶ At NCA, both summers I observed all educators, as all LAIEs are run by a staff of approximately 6 people.

programs at each site, capturing 73 programs total. I did not attend every program I recorded, because in the latter part of the 2013 season I had completed learner interviews and was only recruiting for the survey. Because tours overlap during the day at CTR and DLC, I ended up staying at the visitor's center and capturing all of the tours for the survey instead of attending tours. This means I did not attend 40% of the programs I recorded in 2013. At NCA, while I could have attended all of the programs, I purposefully missed 40% of the programs in order to equalize conditions across all three sites.

At the beginning of each tour, I placed a lapel microphone on the educator and made a brief announcement of my presence as a researcher. This speech changed slightly from 2012 to 2013 as I was not recruiting for surveys in 2012, but generally I informed participants that I was recording the program and taking notes, but that their presence would be anonymous on the tapes. I also recruited for interviewees in 2012 and thanked survey respondent/interviewee volunteers in 2013.

Once the educator began speaking, I started taking notes. I noted the number of people present, the visual racial profile of each person, the weather, and a basic physical description of the tour guide. Regardless of whether I attended the tour, I was able to take these initial notes on all programs. If I attended the tour, I wrote general observations in my field notebook as the tour progressed, noting whether there were any particularly loud or disruptive individuals, and whether the group seemed focused or disengaged (much of the research was conducted on very hot days). I also wrote down audible chatter or questions to the educator. Because I was audio-recording the educator I was able to capture quite a bit of auxiliary data, but my observations remained quite general, as I could not capture a high level of detail for each individual.

At CTR I limited my analysis to the summer public tours, which run on Saturdays and Sundays at 10, 11, and 1pm. I also attended a twilight tour (same content but for adults only), and one “Feeding with a Keeper” tour, which is the longer, pricier, specialty tour. The standard tour lasts 1.5 to 2 hours. The specialty tour lasts 2.5 hours.

DLC offers a basic “Lemurs Live” tour lasting 1 to 1.5 hours that they run three or four times per day, seven days a week. In 2012, I captured programs on weekends and weekdays, but in 2013 I chose to only observe weekend programs because I had found that many of the weekday programs are booked for large groups of children, which effectively makes them field-trip programs instead of public programs. I also attended one “Walking with Lemurs” tour and one “Painting with Lemurs” tour, each of which lasts one hour but provides opportunities to enter the Natural Habitat Enclosures or watch lemurs paint.

NCA’s staff runs a variety of fee-based programs during the summer, including kayaking, crabbing/clamming, keeper apprentice, fishing, breakfast programs, dinner programs, and others. After observing all of the on-site programs in 2012, I decided to include only the behind the scenes tours and the night treks in my analysis. I chose these because the behind the scenes tours were the most analogous in structure to the tours at the other facilities. The behind the scenes offerings included a 45 minute general tour, hour-long tours (which included a shark-feeding tour, an otter enrichment tour, a general feeding tour), and 1.5 hour general feeding tours that only ran on Sundays. I chose to include the night trek even though the structure was different (an indoor seated program followed by a field trip to the beach), because it featured one of the more charismatic animals and because educators included much of the same information about turtles on both programs.

2.3.2. Methods & data for RQ2

My second research question examines the incoming perspective the participant: What experiences, values, beliefs, and behavioral norms do participants bring to the LAIE, and how do learners differ across sites?

Table 2.5: Objectives and data for Q2

Objectives	Data Collection
a) Establish participant's significant life experiences relating to the environment and animals	1) Learner interviews: semi-structured 2) Learner interviews: prompt cards
b) Explore learners' existing environmental values, beliefs, and norms	
c) Understand how participants explain and rationalize their current levels of pro-environmental behavior	
d) Uncover how the learner evokes VBN in their life narrative	
e) Compare the distribution of attitudes, characteristics, and previous experiences among visitors at the three sites	3) Mixed-method survey (demographics, values scales, themes from interviews)

Learner Interviews

Interviews are good for examining environmental values because they allow the respondent to provide a descriptive, holistic, process-oriented, interpretive description of their environmental values (Weiss 1994). However, memory data can prove challenging to collect due to the difficulty in remembering and verbalizing such concepts (Chawla 1998a). I addressed this issue by conducting two types of interviews: traditional semi-structured interviews (see interview guides in Appendices C and D), and semi-structured interviews using prompt cards. I drew frequently mentioned experiences from the Round 1 interviews to prepare cards participants can use to construct a cohesive narrative and think more about making connections between the types of experiences they have had and how their values and behaviors have been shaped by them. When people are given prompts related to original events, recall is improved in both detail and frequency (Wagenaar 1986). This exercise also improved participants' ability to mobilize abstract concepts such as values, which tend to be difficult to verbalize without context or

feedback (Burgess, Limb and Harrison 1988b). I allowed participants to organize the cards in whatever way made the most sense to their personal experience. While this meant that quantifying their responses proved difficult, the purpose of the exercise was mostly to spark conversation and introspection about the shaping influences on one's environmental values, beliefs, and norms; it proved to be an effective tool for this task.

In both rounds, I recruited interviewees by asking visitors at the beginning of the tours if they'd be willing to volunteer to be interviewed. During Round 1, I was only recruiting for the interviews, and 74% of the people I called were interviewed (23 out of 31; Table 2.6). During Round 2, 378 of the learners who filled out the pre-survey included their contact information (66% of participants). Out of those 378, I contacted 67 people, 24 of which ended up being interviewed (36%). The lower Round 2 response rate is likely attributable to the addition of the survey in Round 2: some participants likely filled out the contact information believing it to be part of the survey (not realizing they would be contacted later), and other participants perhaps became disinterested in participating further after completing the survey.

I aimed to conduct participant interviews within two weeks of the LAIE so that the participant's memory would be fresh. Most interviews occurred between one and two weeks after the LAIE, although due to scheduling difficulties some happened later; all interviews were completed within one month of the LAIE.

Table 2.6: Summary of interview data by site

	CTR	DLC	NCA	Total
Traditional semi-structured	7	9	7	23
Semi-structured with card-sorting activity	8	8	8	24
Total	15	17	15	47

Mixed-methods survey

During Round 2, I implemented a mixed-methods survey. This survey primarily consisted of pre-existing VBN metrics and demographic/experiential history information. (Appendix E). I developed the survey using experiences from Round 1 data collection, which helped me decide what data to collect and how to collect it. Most importantly, I learned the majority of the questions for a survey needed to be asked before the program. At the end of the programs people were hot and tired, whereas at the beginning of the programs learners were more alert and engaged. Also, learners were told to arrive anywhere from five to 15 minutes early, so I wanted to take advantage of the loitering time before each LAIE. While the choice to front load the survey had clear benefits, the cost was that my sample did not include people who arrived too close to the program start time. If a party arrived less than five minutes before the program began, I did not administer the survey. Because the survey took five to ten minutes, this choice meant that occasionally people were still filling the survey out when the program started. In these cases, either the guide started a few minutes late (waiting until they were finished), the people finished the pre-survey as the guide was doing the introductory spiel, or they would return incomplete surveys.

My participation rate was high at all three sites (Table 2.7). Across all sites, almost 82% of the adult visitors agreed to participate in the survey; of the 18.4% who were not able to take the survey, the majority of those were people who arrived within 5 minutes of the start of the program. Of the learners who chose not to participate, some needed to watch small children, some had not brought their reading glasses, and some faced language barriers. These issues suggest that parents/grandparents with young children, older adults, and non-native English speakers are underrepresented, but due to the overall high rate of participation, these issues have minimal impact on data quality.

The pre-program survey captured the learner’s pre-existing beliefs and previous experiences in order to explore whether the incoming populations are substantively different at the outset. The first section of the survey asked participants about motivations for attending, previous experiences with animal/environmental facilities, and the characteristics of their party.

Table 2.7. Survey counts and response rates by site.

	CTR	DLC	NCA	Total
Matched pre-post	130	133	139	402
Match rate	60.7%	72.7%	74.3%	69.2%
Only pre survey	28	18	13	59
Only post survey	56	32	22	110
Total	214	183	174	571
Response rate (total)	83.2%	77.5%	84.1%	81.6%
Response rate (matched only)	55.0%	56.3%	67.2%	58%

The second section of the survey consisted of the Animal Attitudes Scale, or AAS (Herzog, Betchart and Pittman 1991). This metric captures sensitivity to animal welfare issues. This metric does not correspond directly to a variable in the VBN framework, but I chose to include it because the relationship between animal welfare attitudes and environmentalism is not well-studied (Herzog and Golden 2009), but it is possible that animal welfare issues activate a different subset of the population than general environmental topics. The AAS asks participants to rate their level of agreement with 20 animal-rights statements (e.g. “The use of animals in rodeos and circuses is cruel”) on a 5-point Likert scale.

The third section included three different metrics intended to capture different concepts in the VBN framework. First, I used a values orientation scale by de Groot and Steg (2007b) because it succinctly measures the three dimensions of environmental values (Schultz 2013). De Groot and Steg’s metric is based on Schwartz’s values scale, which consists of 50 or 60 items, but the shortened one only focuses on values dimensions shown to be associated with environmentalism (altruistic, biospheric, egotistic). The metric lists 13 values (three biospheric,

three altruistic, and four egotistic, including items like influential, helpful, and unity with nature) and asks participants to rate them on a 9-point valuation scale.

The New Ecological Paradigm (NEP) scale served as the general worldviews metric (Dunlap et al. 2000). The NEP scale is one of the most frequently used environmental metrics in the literature (Stern et al. 1995, Dunlap 2008). While the NEP has been reworked into various different scales, I used the 15-item scale, which is the most reliable scale according to meta-analysis (Hawcroft and Milfont 2010). The items make statements about the relationship between humans and the environment (e.g. “We are approaching the limit of the number of people the earth can support”), and participants are asked rate their level of agreement on a 5-point Likert scale. This scale has four separate dimensions, including the belief in the balance of nature, the idea of ecological limits to growth, fear of ecological catastrophe, and the hierarchy of man over nature (Albrecht et al. 1982, Hawcroft and Milfont 2010).

The third metric in the third section focused on the norm activation theory component of VBN theory (Schultz et al. 2005). Norm activation theory includes awareness of consequences, ascription of responsibility, and behavioral norms (Stern 2000). Thus, I used a metric that covered all of those together. In this metric, participants rate the severity of problems and their responsibility for those problems. The metric I chose had very general environmental issues, with the ‘targets’ being things like water pollution, air pollution, and climate change. While some scholars have argued that the compatibility principle requires the item focus to remain constant throughout a survey (Ajzen and Fishbein 1977), others have found that method biases overrule the need to ensure that the items are consistently focused (Kaiser, Schultz and Scheuthle 2007). In other words, asking repeated questions about the same focal object will mean that

participants will not view each question as substantively different from the rest. Thus, in my survey design, I did not aim for compatibility across metrics.

I originally planned to include an environmental behavior metric on the pre-program survey, but I eliminated it for two reasons: first, the whole survey was too long during pretesting, and second, the available behavioral metrics were either too long to administer in the time before the program (e.g. Kaiser and Wilson 2004), or they were too short, causing construct validity issues (e.g. Dutcher et al. 2007, Schultz and Zelezny 1998) Thus, I decided not to include a behavior metric on the pre-survey.

The final section of the survey collected demographic information. While this study is not hypothesis-driven, learner demographics are likely to have some explanatory power over the VBN variables, so this effect must also be captured. Past research has shown individuals who are young, female, liberal, educated, white, and higher socioeconomic status tend to score higher on a variety of psycho-social environmental measures (Blocker and Eckberg 1997, Van Liere and Dunlap 1980, Jones and Dunlap 1992, Honnold 1984, Palmer and Suggate 1996).

At the end of each LAIE I administered the post-program survey, which was one page long. I marketed the post-program survey as being “much shorter than the first one,” and participation in the post-program survey was higher than the pre-program survey. The post survey included a list of 11 behaviors that might have been suggested or inspired by the LAIE, including items such as donating money, volunteering, or seeking ways to reduce one’s impact on the environment. I generated this list using the behaviors discussed during Round 1 LAIEs and interviews. I also had three free-response questions: “What are the three most important things you learned during your tour?” “Do you think it’s important for this facility to exist? Why or why not?” and “Do you think it is important to conserve these animals in the wild? Why or

why not?” These questions were meant to get a sense of how learners ranked the urgency and importance of the information they received on the LAIE, and how perceptions of animal conservation and institutional activities differed across sites.

2.3.3. Methods & data for RQ3

My third and final research question examines how the LAIE interacts with the learner: How do learners internalize, interpret, and make meaning of LAIEs across different organizations, and how do post-LAIE behavioral intentions differ across sites?

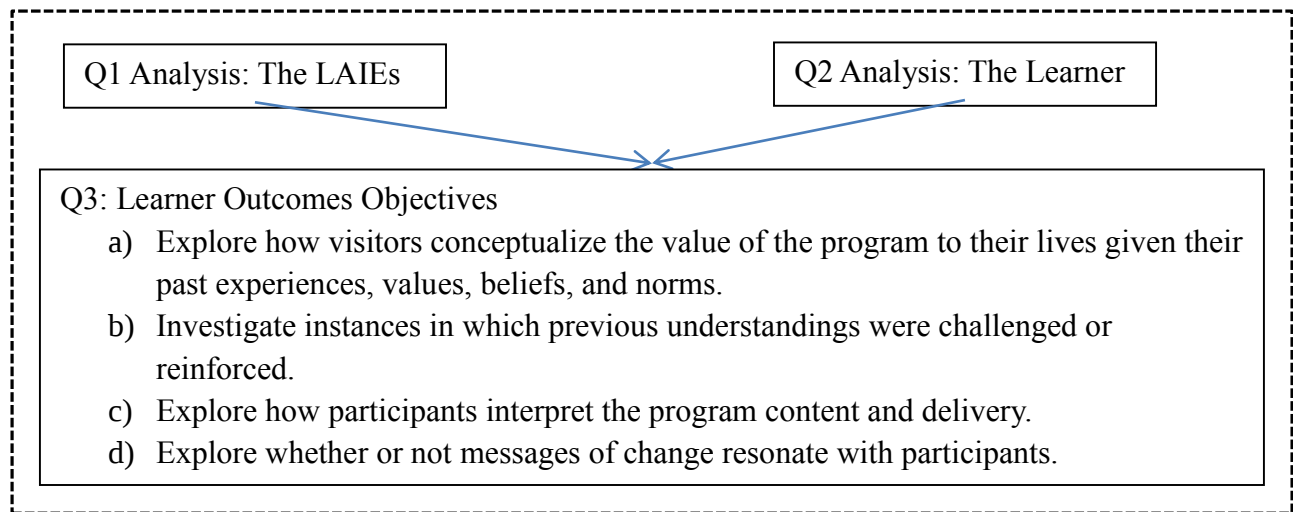


Figure 2.2: Visual Diagram of Q3 Research Objectives

In my third results section, I analyze learner interview data focusing specifically on program reactions and interpretations and the post-program survey results. I then interface this data with results from the RQ1 and RQ2 to observe how the program impacts the learner (Figure 2.2). This holistic synthesis allows me to explore how LAIE characteristics interact with the learners’ incoming experiences to create learner outcomes, with specific attention paid to the variables in the VBN theory (while remaining open to other types of outcomes). I also examine outcomes as described by the learner to better understand how these impacts are shaped by the characteristics of their past and current experiences.

2.4. Data analysis

I coded interview and LAIE transcripts according to best practices in qualitative research (Saldana 2009). I also borrow strategies from grounded theory practice (Strauss and Corbin 1990), as I coded for VBN themes as well as emerging themes. First, I coded attributes (Lofland 2006), so that I could organize by field site, type of data, and 2012 versus 2013. Then, I conducted structural coding in which I isolated elements of the VBN variables (valued object, threat to valued object, etc., through the behaviors), SLE themes, as well as any other areas of interest. For example, I coded for “science/research” and “quality of care” so that I could isolate when those topics were discussed. Once I coded into sections, I engaged in a second cycle of coding, pattern coding, in which I developed major themes based on the clusters of data (Miles and Huberman 1994). After I had developed themes, I selected quotes to display in the results chapters based on their ability to succinctly capture the theme at hand. For themes that were not site-specific, I also selected quotes so that they would showcase all three sites evenly. I coded all of my qualitative data in ATLAS.ti.

For the written materials, including the newsletters, websites, and Facebook pages, I engaged in qualitative content analysis (Neuendorf 2002). This involved first open coding each article/passage into categories, and then further analyzing for themes within categories (Elo and Kyngäs 2008). I developed different categories depending on the type of data, but the categories emerged organically within the theoretical lens (i.e. I prioritized concepts that addressed values, beliefs, norms, and behavior). I was also careful to create categories that could be universal across sites, as opposed context-specific categories. This process allowed me to uncover patterns in the types of information each organization puts out as well as the qualitative feel of the

messages. During data collection, transcription, and analysis, I kept a field journal and coded that text for the same themes.

Finally, I looked at the interfaces between various types of data to see how the messages flow from one group of agents to another. First, I looked at the relationships between the different information from the institution: how do the messages from leadership match with the website and the Facebook page? I also looked at the relationship between what the educator says and what the institution tells them to say in their training materials. I also compared educator intentions to the messages in the programs: do educators say what they wanted to say? What messages really came across if not the ones they intended? I used the same codes across LAIE transcripts, educator interview transcripts, and learner transcripts, and I used codes that could be universal to all three sites, avoiding site-specific concepts like “tigers” or “ocean” for example. These coding practices allowed me to more easily compare across different types of data and across institutions.

I analyzed survey data using Stata v.13. For RQ2, I only used data from the pre-program survey. I first explored differences between learners at each site using one-way ANOVA, two-way t tests, and chi-squared tests depending on the type of variable in question. I then used multiple linear regression to model each of the VBN metrics individually as a function of site, controlling for demographics (gender, age, political affiliation, education, income, race, and environmental professionalism), and one measure of social desirability (whether they provided their contact information on the front of the survey). I also ran correlations between all of the VBN metrics, and I obtained variance inflation factors to test for multicollinearity among regression variables. For the third research question, I used two types of regression modeling. For the individual behavioral outcomes, I used ordered logistic regression because the outcome

variables were individual Likert questions, as opposed to a continuous variable. I also created a mean score for all 11 behavioral intentions that I modeled using multiple linear regression, with behavioral intentions as a function of the VBN metrics from the pre-program survey, again controlling for demographics. While the VBN theory is structured as a path model, I include VBN metrics as covariates in my regression model because VBN theory suggests that all variables can influence others in different parts of the chain (Corral-Verdugo 1997, Corbett 2005).

2.5. Reliability and validity

Validity in qualitative research is not so much a statistical process as a process of accurately capturing reality as perceived by participants. Thus, I achieve validity by implementing policies to ensure that the process maximizes my ability to perceive that reality. I adopted a checklist by Maxwell (2005) of strategies to maximize validity in qualitative work. This required me to be intensively involved in my field sites; I spent many hours interacting with the sites and the educators outside of the programs. I also collected “rich” data by transcribing many of my tapes, solicited respondent validation from key informants and educators, focused on discrepant evidence/negative cases, triangulated data on the institution, produced quasi-statistics (simple way to detect prevalence), and of course, compared sites. I also follow practices outlined by Yin to maximize validity in case study work by using multiple sources of evidence to create a chain of evidence (construct validity), using multiple cases as replicating logic (external validity), and ensuring replicability by documenting/systematizing my process as much as possible (Yin 2009). Qualitative research calls for a sufficiently detailed description of the methods, data, and biases inherent to research, so that validity can be assured (GAO 1996).

Post-normal science also acknowledges the researcher as a participant in the research, thus I assume my presence has influence on the study system. Throughout my study, I remained aware of and actively disclosed my biases, personal limitations, and investment in the subject matter (Dwyer and Limb 2001). I did this by keeping a journal about my own reactions to the data collection and analysis process and by disclosing my own experience as an environmental educator and CTR animal care volunteer during interviews and LAIEs in which the topic arose.

For the survey, I engaged in several practices to maximize reliability and validity. First, I aimed for 100% participation in the survey during my study period, which minimized sampling error. In order to achieve high levels of participation, I incentivized learners with a raffle for a membership at each site; this helped capture the participants who were interested in research and those with different motivations. The comparative nature of my study also helped correct for sampling biases, as theoretically the same challenges existed at all three sites.

I considered potential method biases when designing the survey. These included common rater effects (artificial covariance between two questions because the respondent is the same person), item characteristic effects (when people select an item because the properties of the item, such as its social desirability), item context effects (interpreting an item based on the other items present on the survey), and measurement context effects (asking questions at the same time/location/conditions) (Podsakoff et al. 2003). I corrected for these issues the best I could by using validated scales from the literature, as they have been tested on larger populations for construct validity. I also used scales from different parts of the literature for each VBN variable, because previous work has shown that while previous research has used the compatibility principle (i.e. where the subject for each section is identical) to create a logical chain along VBN, that common rater effects and measurement context effects bias those studies (Kaiser et al.

2007). This means using diverse constructs representing different aspects of the VBN chain is preferable. Most importantly, using a comparative lens helps correct for these issues, as issues will be similar across sites. Shadish et al (2002) provide an exhaustive list of threats to internal, external, construct, and conclusion validity, and I used those as well as the list by Podsakoff et al. in the design of my survey instrument.

After the preliminary research, I conducted two focus groups in order to better understand respondent interpretations of each question. The focus groups were conducted mostly to work through the survey content, but we also discussed environmental values and beliefs generally, as small groups provide a useful medium in which to explore values (Burgess, Limb and Harrison 1988a). These focus groups helped me better understand how the survey metrics align with participant reality. Through the groups, I found that there is enough nuance in an individual's values, beliefs and norms, that the scales must be considered to be useful but imperfect measures of VBN. Between the first and second focus group, I also ran a pre-test for my instrument at two of the three sites (n=31) to ensure that the survey was capturing variation and that it was feasible to complete before programs at each site.

Interviews and surveys together represented the ideal way for me to detect emergent themes and to understand the distribution of visitor characteristics across three sites. Because interviews allow subjects to recall and construct their own history and meaning (Madison 2005), interviews uncover the nuances and depth of the visitors' environmental histories. By administering the same survey at all three field sites (see Appendix E), I can systematically compare visitor populations across sites for both demographic characteristics and for environmental values, beliefs, and norms using metrics from the literature. While these two types of data collection

reinforce each other, I limit comparisons across them, as they each help me understand different aspects of the learners at each site.

CHAPTER 3: THE INSTITUTION

3.1. Chapter overview

This chapter presents results for my first research question outlined in Chapter 1: How does the institutional context frame messages on values, beliefs, and norms, and how do educators internalize those messages and articulate them during LAIEs? To answer this question, I use the values-beliefs-norms (VBN) theory to frame each institution's education programs (Stern et al. 1999). Using key informant interviews, institution-generated content, educator interviews, and LAIE observations, I construct a typology of VBN-messaging pathways, placing each organization into an adapted VBN framework. I follow the mission from the organization through to the values embedded in their education programs to understand how messages are crafted in each location based on the institutional context. By comparing this pathway across three organizations differing in their institutional missions, I shed light on how mission relates to the communication of VBN messages. Even though each organization has other components to their mission (which is the source of the comparison), all three organizations clearly state the importance of animal conservation in their missions and programs, lending themselves to meaningful comparison. I also consider best practices in education and comment on the usefulness of VBN as a framework.

I first outline how each organization values the animals, setting up each one within a modified VBN typology. Then I explore how those animal values are interpreted and adopted by the educators. Finally, I show the ways they are communicated in the LAIEs. I demonstrate how

each organization conceptualizes the value of the animal differently, and that these differences are expressed both in written materials and during LAIEs.

3.2. Institutional Context

In this section, I describe the mission, organizational practices, and outreach content at each site. Understanding each organization's characteristics is important because LAIE content is shaped by institutional context. Thus, I provide a brief history of the organization, an analysis of Facebook/newsletter content, and a description of educational goals in each context. As educational activities can serve a variety of functions within an organization, understanding how the organization itself perceives the purpose of educating the public is a critical step in understanding how their VBN-related content is developed and communicated.

3.2.1. Carolina Tiger Rescue

CTR is a “non-profit wildlife sanctuary whose mission is saving and protecting wild cats in captivity and in the wild” (CTR 2012). Formerly the Carnivore Preservation Trust, the organization was founded in the 1980s by a UNC geneticist, Dr. Michael Bleyman, as a breeding facility for rare carnivores (CTR 2012). However, as zoos and other larger organizations began to take part in endangered species management, they switched their focus to wildcat rescue, and in 2000 they ceased their breeding program entirely to focus their resources on wildcat rescue (CTR Key 508). Today they provide homes for wildcat rescue animals as well as the aging population of ocelots, binturongs, kinkajous, servals, and caracals remaining from their breeding programs (CTR Key 127). CTR operates on a small budget, depends heavily on volunteers, and is a relatively low-tech facility, with little interpretive signage, grounds development, or infrastructure. Most of their budget comes from individual donations, tour fees, and memberships. While CTR is broadly supportive of in-situ conservation, the organizations has no

programs or direct ties to any conservation programs in the wild habitats of their carnivore residents (CTR Key 570).

Out of the three organizations in this study, Carolina Tiger Rescue focuses most explicitly on animal welfare institutional values in their educational and institutional messaging. CTR's mission uses the key action verbs of "saving and protecting." Protection is in many ways analogous to conservation, but the word protection implies a more active guard against threats. Together these words evoke a specific commitment to animal welfare not mentioned in the mission statements at DLC or NCA. In addition to their mission, CTR created a list of core values that includes opposition to private ownership of wild animals, the use of wild animals in entertainment, breeding outside of species survival plans, and illegal hunting and wild animal trade (CTR 2012). CTR displays this list of values on their website, and tour guides are required to memorize CTR's values and include them in tours (CTR Key 127).

Currently CTR is the only one of the three organizations with an official set of institutional values, but they have not always had a clear values system. When Dr. Bleyman founded the organization, there was little attention to institutional structure. Rather, Bleyman sustained the organization financially using his own network and charisma (CTR Key 570). When Dr. Bleyman died suddenly in 1996, the organization went through an unstable period, passing through several executive directors and running a hybrid rescue/breeding organization until Pam Fulk, the current director, came on board in 2003 (CTR Key 570). She engaged the staff and board in a process of defining the mission and values of the organization, which stand intact to this day (CTR Key 508). This focus on the values of the institution has made the values culture more strict at CTR, where staff and volunteers are expected to uphold the values of the organization in the own life. For example, two interviewees mentioned they were discouraged by

staff and other volunteers from watching the movie “Life of Pi” because the movie filmed live tigers (CTR Educators 557, 565). CTR’s core values articulate the overarching belief that tigers and other wild animals deserve the right to a good life, ideally in a wild habitat, but if no wild habitat is available then a place like CTR is necessary (CTR Key 570).

While the mission includes saving wildcats in the wild, the activities of the organization overwhelmingly favor saving wildcats in captivity. Most of the money and efforts of the organization go into acquiring and caring for rescue animals. When asked about this, both key informants and educators responded that the education programs hopefully contribute to the conservation of cats in the wild, but that they do not explicitly set goals in this arena; this interviewee captures the sentiment well:

“I don't really know what we do to address that [in-situ conservation component] aside from... Just making people more aware of these animals and more aware that they're [endangered], and more aware of their importance in the environment, so maybe motivating people to actually, even though we don't necessarily explicitly tell them to do something, motivating them to do something about it, about protecting them or protecting their habitat in the wild.” (CTR Educator 30)

So while CTR is broadly supportive of wildcat conservation, their organizational activities focus on rescue, education, and animal care.

To compare Facebook posts, I coded each post into emergent themes that were generalizable across sites. I only coded the organization’s original post, not any responses to content. CTR’s Facebook posts focus most heavily on the individual animals and ways the public can support CTR. During my study period, 51% of CTR’s Facebook posts featured the animals in the sanctuary, either on photos of the animals or on the comings and goings of animals (mostly deaths and rescues; see Table 3.1 for Facebook post distributions, and Appendix F for examples). Further, CTR Facebook posts always included the animal’s name, and if there was a caption, it typically highlighted on the personalities and the behavior of the animals there, such as, “Nakobi

is still up for stalk and pounce when it's hot, Raj is definitely up to something, and Lola is just curious and cute!" (8.11.13). These posts use the animal's name, personality, and activities to emphasize the importance of the individual animal. Of the remaining 49% of the Facebook posts, 14% of the posts advertised an on-site activity (either tours or events), and another 20% described other ways to help the organization, such as shopping at an event to benefit CTR.

Table 3.1. Facebook post categories and distribution by site.

Code	Description	CTR	DLC	NCA
Animals	Pictures, facts about onsite animals	38 (37%)	8 (9%)	25 (27%)
Events at center	Onsite benefits, tours, camps	14 (14%)	20 (21%)	37 (39%)
Other ways to support org/species	Conservation behaviors, shopping, donations, etc.	20 (20%)	15 (16%)	5 (5%)
Animal comings/goings	Births, deaths, arrivals, departures, internal movement	14 (14%)	10 (11%)	10 (11%)
People at the center	Volunteers, staff, interns	5 (5%)	4 (4%)	3 (3%)
Research	on- and off-site	0 (0%)	8 (9%)	3 (3%)
Engaging with audience	asking for guesses for questions, reactions to things	2 (2%)	6 (6%)	4 (4%)
Other interesting events, information	FYI from varied sources	5 (5%)	14 (15%)	4 (4%)
"Anthropofun"	pictures of animals with them talking or similar concept	4 (4%)	9 (10%)	3 (3%)
TOTALS		102 (100%)	94 (100%)	94 (100%)

For each of the newsletters published during my study period, I coded each story into an emergent category, assigning each article one code based on the central thesis of the article. I considered an "article" to consist of a discreet unit of text (sometimes but not always accompanied by photos) that was visually distinguishable from other content. I found that while some content was comparable across sites, each newsletter had a decidedly different focus, thus I consider each separately.

Table 3.2. Newsletter content at CTR only, categorized by article (n=34).

Concept	Examples	% Articles (n=34)
Ways to help	Estate gifts, wild cat wish list, shop in gift shop, big cat dinner club, meat donations, workplace giving, volunteer	35%
Thank you	For giving rescues a home, for donating, volunteer of the month (regular column), list of donors	21%
Education and events	Family appreciation day, Benefit art sale, holiday tours, Black Tie & Tails, summer camp	18%
Values	Why wild cats are bad pets, captive breeding is wrong	9%
Onsite animal lives	Keeper's log (regular column), "Recently in the sanctuary"	9%
Outside validation	Small business award, applied for GFAS	6%
Cool animal	Binturongs	3%
Total		100%

CTR printed three newsletters from June 2012-August 2013, with 34 total articles. The majority of CTR's newsletter content focuses on helping CTR (Table 3.2). Of those stories, 35% outline ways you can help the organization and 21% thanked volunteers or donors, totaling 56% of the features focusing on helping CTR. After that, 18% focused on events and education programs held at/by CTR, another 15% described activities in the onsite animals' lives, and 9% explicitly outlined value statements. In addition to the 56% of the newsletter's written content focused on ways to help CTR (including ways to help and thanks for help), most of the other articles mention ways to help CTR. For example, most of the events are fundraisers for the center, and even when the focus of an article is on a new rescue animal, the author also mentions, "Please visit soon and remember that a lot of ongoing support is needed to give the animals lifelong care" (CTR Summer 2012). In addition to the text in the newsletter, a total of 41 pictures of animals from the sanctuary were printed, 33 of which (80%) had the name of the animal

printed in a caption. In short, the newsletter mostly promotes CTR's needs and the ways the public can help fulfill these needs, and photos emphasizing the individual animal residents are prominently featured in both the newsletter and Facebook feeds.

The newsletter focus on CTR and its animals comes in lieu of a focus on conservation. In all of the text of the newsletter, threats to wild animals were mentioned five times, and all five mentions were brief (one or two sentences). For example, in one of the values-themed articles, the author states, *"The proliferation of wild cats in captivity drains resources that could otherwise be directed toward saving their species and habitats in the wild – where they belong!"* (CTR Fall 2012). Another article thanking donors for their help includes a powerful evocation of the underlying values, and by using the second-person language, also speaks to norms as well: *"You give for future generations, so this world will continue to show kindness, respect, and concern for the astonishing species that share this planet."* (CTR Fall 2012).

The main purpose of the education programs is to serve as a way to promote CTR's values (CTR Key 127). While all of the organizations include some mention of education as a means of *achieving* the mission, CTR has the most direct relationship between the institutional values and the educational messages. Key informants cited the core values as not just important messages, but unquestionably required messages:

"Everybody can add their own flavor and their own anecdotes, but there has to be a core curriculum that is part of every tour. And it is not negotiable. And it is that here is their plight in captivity, here is their plight in the wild, here are the things you can do." (CTR Key 508)

The tone of this quote captures the intensely mission-focused nature of the education programs at CTR, as well as the call to action that is present in the newsletter and Facebook feeds. However, while the key informant quote makes the action component apply to both the wild and captive populations of cats, the action items in the newsletter and Facebook feed during the time I

observed all focused on helping animals in captivity, as opposed to wild populations, and all but two of the Facebook posts about helping animals were specifically about helping CTR's animals (as opposed to wildcats in captivity in general).

3.2.2. Duke Lemur Center

DLC is an affiliate of Duke University, and its mission is to “promote research and understanding of prosimians and their natural habitat as a means of advancing the frontiers of knowledge, to contribute to the educational development of future leaders in international scholarship and conservation and to enhance the human condition by stimulating intellectual growth and sustaining global biodiversity” (DLC 2012). Through using the action phrase “promote research and understanding” in their mission, DLC establishes that research is the key function of the organization. Even though the word “understanding” can also refer to education, understanding is also inclusive of scientific discovery as opposed to focusing exclusively on public engagement.

DLC was founded in 1966 as the Duke University Primate Center as a collaboration between two biologists, one at Duke and one at Yale (DLC Key 196). Using an NSF grant to establish the center, DLC was built on 80 acres 2 miles from Duke's campus. They currently house approximately 250 individuals from 21 species, which means they have the largest population of lemurs in the world outside of Madagascar (DLC 2012). DLC keeps and breeds lemurs onsite and does in-situ conservation work in Madagascar (DLC Key 215). As DLC is affiliated with Duke, the organization has considerable resources and infrastructure available for animal care, research, and education.

DLC has transitioned over the last 20 years from an organization that was largely unknown to one that interacts substantively with the public and the Duke University community.

DLC's funding structure has shifted dramatically in response its increased visibility. Five years ago DLC was generating only 8% of their budget (relying mostly on Duke and NSF), and they now bring in about 30% of their budget through tours and fundraising (DLC Key 196). This is a significant change because NSF and Duke funding cannot be used for DLC's conservation programs in Madagascar, so with the increased education revenue, DLC has expanded its in-situ conservation efforts (DLC Key 215).

Despite diverse activities and increased visibility, the Lemur Center's mission remains focused on scientific research. Even though my key informants and educator interviewees emphasize DLC's education and conservation work, the mission is carefully worded to emphasize research as a means to meet other goals. DLC is housed by Duke under those pretenses, and Duke is mostly concerned with maintaining a steady stream of high-quality research from DLC. One key informant describes DLC's relationship with Duke:

"First and foremost, Duke looks at us as a research center and that is their number one priority at Duke. Duke could care less if we had people coming in or out the door. I think it's different now, because we are becoming such a part of the Duke community. Whereas before, we were the red-headed step-child off in the forest, but they want to see the research generated outta here. They want to see papers written, they want to see the students learning how to watch animals, how to record data and that is Duke's main goal for us. The education was always kind of an added thing. Conservation was an added thing. Duke does not fund our conservation efforts." (DLC Key 133)

So while DLC engages in diverse activities, their institutional identity is still very much shaped by their research affiliation with Duke.

DLC's Facebook posts reflect the diversity of their activities, including their scientific work. On-site events promotion topped out the list at 21% of posts. Next, 16% of posts highlighted other ways to support DLC, and 15% of posts relayed other interesting information from other sources. Approximately 10% of the posts discussed each of the following topics:

animals at the center, comings/goings of animals, research at the center, and “anthropofun.” I labeled a post as anthropofun when it made the animal human-like, such as “it’s only Monday?!” with a picture of a surprised-looking lemur. DLC’s feed also had more emphasis both on research activities and on the scientific components of lemurs.

The language DLC uses in their posts reflects their value for lemurs as a scientific subject. Within the category animal-focused posts, as opposed to emphasizing the name and personality of the lemurs, they present facts about animals, such as, “*#Olympic Lemur Gymnastics - Uneven Bars: Lemurs have strong feet that grip almost like their hands. #LemurGold*” (8.3.12). Even when DLC posts include the animal’s name: *The Adventures of Elphaba the Aye-Aye! She can tap 8x's a second, chew through logs and grubs fear her name!* (7.6.13), the focus remains on scientific facts about the animal as opposed to Elphaba’s thoughts and feelings.

The DLC newsletter also prints diverse content in their newsletter (Table 3.3). DLC printed four newsletters during my study period, averaging 14 stories per newsletter (CTR averaged 11, and NCA’s newsletter is only event announcements). Putting their newsletter into analogous categories to the CTR newsletter proved to be difficult, so I ended up creating a separate code list, although four of the codes are the same across CTR and DLC.

DLC newsletter stories proved difficult to categorize, because individual articles brought in multiple types of information. For example, one story in the “staff and volunteers” code features the experiences of a four-year work study student, who described his experiences both in animal care and research in Madagascar. Much like the CTR newsletter stories find ways to emphasize the needs of the organization in every story, the DLC articles emphasize the multiple types of work at DLC, as the different facets of their work are tightly intertwined: research assists in in-

situ conservation work, on-site animals participate in research, and in-situ work is featured in educational programs. The newsletter showcases diverse perspectives as well, publishing contributions from researchers, staff, volunteers, and interns.

Table 3.3. Newsletter content at DLC only, categorized by article (n=54).

Concept	Examples	% of Articles (n=54)
Staff and volunteers	Summer intern program, work study experiences, volunteer spotlight (regular column), staffing changes	19%
Research	Mouse lemurs (for human benefit), training for lemurs, responses to training, fossil primate update (regular column)	17%
Onsite animal lives	breeding colony decisions, new babies, stories of NHE lemur lives, Romeo died, baby lemur weights	15%
Education and events	Different tours, expanding offerings, go to Madagascar with DLC, IMAX movie	13%
Madagascar experiences	Student visits, staff visits	9%
Physical plant improvements	new fencing, new winter housing, new digital radiograph machine, new database, tech updates for research	9%
Professional events	Rosewood symposium/concert, aye aye conference	6%
Thank you	Adopt a lemur champs, list of donors	4%
Duke	Duke mascot, Nicholas School collaborations	4%
DLC history	Note from founder, memories of first summer	4%
Ways to help	buy books to support lemurs	2%
TOTAL		100%

The most common topic in the DLC newsletter is human experiences, coded as “staff and volunteers.” While some of the articles in this code also discuss lemur research and care, I put an article in this category if the point was showcasing the human working with DLC. Because DLC

works with students, interns, volunteers, staff, and researchers, many perspectives are shared in the newsletter. The second most common topic in the DLC newsletter is research. 17% of the articles focused on research, most commonly focusing on their mouse lemur research which has human benefits (mouse lemurs get Alzheimer's). Next, 15% of the articles featured onsite animal lives, but the topics in this section focused almost exclusively on breeding, which gives it a very different feel than the same category at CTR, which focuses primarily on new rescues and deaths. And the focus on breeding reinforces their value as a center for conservation breeding, emphasizing the species above the individual, like this quote: *"One discouraging fact was that of eight sifaka infants born, seven infants were male, with only one female birth! Generally more males are born than females in captive sifaka, often at a rate of 2 to 1, but this ratio is truly alarming, and hopefully a onetime occurrence."* (DLC Spring 2013). Like CTR, DLC also promotes education and events in their newsletter, (13%), but unlike CTR, they make very little mention of ways the individual can help DLC; I only coded one article asking for help, and only two thanking for help.

According to key informants, the purpose of education at DLC is to publicize the work of DLC as a means to inform about conservation:

"We really try to incorporate more of our conservation message, the research that's being done here and the importance of the Center and why the Center is here. So, it's more of an overall message, so people really get the idea of why there are 250 animals in the middle of Duke Forest and not just for their viewing pleasure." (DLC Key 133)

The idea of an "overall message" alludes to the diverse activities at DLC, but most importantly, focuses on educating about DLC's work, and then using that work to provide concrete examples of conservation in action. Also, the last part of the previous quote addresses to one of the key motivations of this project, which is the growing sentiment among captive animal professionals

and the public that there has to be a justification for keeping animals in captivity *beyond* human entertainment (Hutchins et al. 2003).

3.2.3. North Carolina Aquarium at Pine Knoll Shores

NCA is a publicly owned aquarium on the North Carolina coast. The State of North Carolina owns four facilities, including aquariums in Fort Fisher and Roanoke Island and Jennette's Pier in Nag's Head. The mission for the whole North Carolina Aquarium system is, "inspiring appreciation and conservation of North Carolina's Aquatic Environments" (NCA 2012). With the word "inspire" modifying both appreciation and conservation, NCA's mission frames the Aquariums as educational institutions above all else, and the mission makes no mention of NCA's direct role in conservation activities.

NCA first opened in 1976 as a teacher resource center, but over time the exhibits and foot traffic grew in response to increasing demand for public aquarium space (NCA Key 151). In 2004 NCA underwent a major renovation, and in 2006 NCA re-opened a new 90,000 square foot facility (three times bigger than the old aquarium). NCA also modernized its education and interpretation offerings (NCA Key 509). NCA is accredited by the Association of Zoos and Aquariums (AZA), which is the premier certification demonstrating commitment to conservation, high quality animal care, and education (AZA 2012). NCA is the only one of the three organizations in this study that is open to the public without a guided tour.

While NCA does charge for admission, state subsidies allow the aquarium to keep the costs exceptionally low; an adult admission ticket was \$8 both summers I conducted fieldwork (the National Aquarium and the Georgia Aquarium are \$35, in comparison). NCA is the only one of my three sites that began with education as its mission, starting as the equivalent of an agricultural extension office for marine resources (NCA Key 151).

Because NCA is a state facility, it is subject to some of the unique opportunities and constraints a state agency faces. Most notably, while NCA does not have to fundraise as much as CTR and DLC, it does struggle with the rigidity and top-down structure of the state-run system (NCA Key 514). However, despite the relative stability of state support, NCA has also experienced financial strain in the last few years, having their budget cut by some percentage every year, and now they are transitioning to a business-like model:

“We’re making the slow evolution from being a static state-run facility to being more entrepreneurial, more nimble, more customer-focused. So we’re trying to run the aquarium more like a business, and less like a state agency.” (NCA Key 151)

Even though NCA is transitioning to a business-like model, this key informant reassures that the focus remains on the customer, which in this context is analogous to the learner, thus reinforcing their commitment to education.

Because the aquarium focuses primarily on education, education is more systemic to its operation. In other words, while CTR and DLC keep their animals for either rescue or research (respectively) and show them to the public as a secondary activity, NCA *only* has animals for educational purposes. Of course, not all staff members are necessarily motivated by educational goals, but this distinction is important because the focus on the learner at the institutional level is most pronounced at NCA.

While education is NCA’s main focus, NCA actively participates in two types of in-situ turtle conservation efforts. First, they collect hatchlings who have not been able to escape their nests, raising them at the aquarium for two years (and using them in education programs), and then releasing them into the Gulf Stream. Second, they rehabilitate and release cold-stunned turtles in the winter. These conservation efforts are heavily featured in their education programs (NCA Key 514).

NCA posts most frequently on Facebook about events at the Aquarium (39%), which falls in line with their emphasis on education and public engagement. NCA is also the only site in my study that has a large facility that can accommodate big events. Next, they post about animals at the center 27% of the time; 16 out of 25 of those posts used the theme of “animal of the week,” in which a brief fact about the animal is relayed along with some photos. For example, on 5/3/13, NCA featured the Bonnethead shark, stating: “*The bonnethead shark – the smallest “cousin” of the great hammerhead.*” Aside from those two major categories, 11% of the posts wrote about for animal comings and goings (all but one of these posts were about sea turtle intake/release), and after that none of the categories break 5%. Finally, the only entries coded as “asking for help” were the “conservation Wednesdays” posts, in which they describe specific conservation behaviors in one’s personal life, such as “*Headed back to school? Ditch plastic sandwich bags, plastic water bottles and paper lunch bags! Pack a no-waste lunch bag, by using reusable containers that help save money and the earth! Need ideas?*” (8.14.13). At no point do they solicit memberships or donations on their Facebook feed.

The NCA newsletter is entirely events-themed. While CTR and DLC produce quarterly newsletters that read like newspapers, NCA sends a monthly newsletter consisting of a single paragraph that describes upcoming events at the Aquarium. They advertise special events, such as the Annual Otter Birthday Bash, or they highlight ongoing events/opportunities such as Turtle Tuesdays, the flight show (presented seasonally), or the behind the scenes tours. So NCA uses their newsletter entirely for the purpose of encouraging subscribers to spend more time at NCA.

At NCA, as education is the mission itself, key informants focused more on the value of education as a *general* conservation tool to help increase environmental awareness and action:

“We want people to understand, and have an ocean ethic. We want them to understand the importance of the ocean and that it's their responsibility to take care of it. And there's a variety of different things that feed into that.” (NCA Key 509)

“Reduce reuse recycle is a mantra that most people are familiar with, and so we try to encourage that and use our aquatic animals as examples for why that's important.” (NCA Key 151)

These key informants outline NCA's goal of using their education programs to connect visitors to the larger messages about environmental responsibility and care.

3.2.4. Summary

The three institutions share key similarities as environmental organizations housing animals to help achieve animal conservation goals, but each frames its animals and its work differently to achieve those goals. CTR's work focuses primarily on rescue, and the messages about conservation are framed that these animals *belong* in the wild, establishing their right to a wild existence but spending few organizational resources toward that goal directly. Their Facebook and newsletter content focus considerably on the animals as unique, personality-filled individuals, and on the needs of CTR as an organization.

DLC, in its focus on science and research, demonstrates the most concrete commitment to in-situ conservation, and their communications reflect the diversity of their activities and resources but on a specific group of species in a specific location. DLC demonstrates this commitment to lemurs primarily as a group of *species*, and they use their public interfaces to demonstrate that they make substantive contributions as an organization to the conservation of lemurs through both in-situ and ex-situ activities.

NCA is above all else an educational facility. Thus, they value their animals because they are vehicles on which NCA can deliver messages about stewardship of aquatic environments. Their broad mission casts the value of the animal as an *ecosystem* ambassador, where the animals

are being kept to be shown as representatives of the local environment, and the animal’s meaning can be shifted depending on the goal of the individual program. Both their Facebook content and their newsletters reflect a direct focus on the learner as the primary agent in conservation behavior.

While I created different codes for each newsletter group, some codes emerged at two or three sites (Table 3.4). DLC produces the most diverse and “uncategorical” newsletter, whereas CTR overwhelmingly focuses on helping the organization, and NCA exclusively focuses on education program promotion. By looking at both social media (Facebook) and the newsletters, I can comment on both a traditional and modern form of communication from each organization, and I find that each organization uses their media outlets to promote the work that they do and the values that they represent.

Table 3.4. Newsletter content comparison across sites.

Concept	CTR %	DLC%	NCA%
Education and events	18%	13%	100%
Ways to help	35%	2%	0%
Thank you for help	21%	4%	0%
Onsite animal lives	9%	15%	0%
Other	17%	66%	0%

3.3. Educators

As the primary interface between the organization and the public, the educators themselves must be examined as a critical force driving LAIE content. The purpose of this section is to provide insight into the educational team as an agent in the delivery of LAIE. To achieve this purpose, I explore differences in staffing structures across sites, comment on the

differences between individual educators, and outline educator goals using themes that uncover both site-specific and unifying goals across sites.

3.3.1. Staffing structure at each site

Each organization uses a different combination of volunteers, staff, and interns to run their programs (Table 3.5).

Table 3.5. Educators in my LAIE sample by site, 2012/2013.

	CTR	DLC	NCA
Total # educators observed	18	16	11
Permanent staff	2	3	4
Seasonal/interns	0	3	7
Volunteers	16	10	0
% present both summers	83%	50%	36%
Average age	39	37	25
% female	77%	56%	55%
% white	100%	100%	100%

CTR uses almost entirely volunteers to run their education programs. CTR only uses staff to run public programs for specialty tours or when no volunteers are available. DLC uses a combination of staff, summer interns, and volunteers. At DLC, I observed three staff, three interns, and ten volunteers. NCA uses only staff and interns to run their programs. Educators were all white at all three sites, and they were majority female at all three sites.

While one might expect these staffing differences to lead to differences in LAIE content and delivery, there are three key equalizing forces at these institutions. First, turnover was low among the educators I observed at all three facilities, and my interview data suggest that worker/volunteer satisfaction is quite high at all three sites. At CTR, all of the seven 2012

volunteer guides were still present in 2013, and the only person who left between field seasons was the staff member who had led a specialty tour. I also observed at least six CTR volunteers who had been active for more than five years, with two of those guides having volunteered for almost 20 years. I observed several long-time DLC volunteers as well, but DLC also employed seasonal interns and staff both summers I collected data, so DLC's overall turnover rate was slightly higher; of the seven guides I observed in 2012, all but two were present the following year. NCA uses the most seasonal labor, as they experience much heavier traffic during the summer season, so of the eight educators I observed in 2012, only four remained in 2013.

The second equalizing force is the frequency with which educators give programs. While NCA educators have the shortest tenures in the education program, they give a large number of programs in a short time; in 2013, six educators conducted all of the LAIEs. As a general rule across sites, interns/seasonal staff typically lead multiple programs per week, whereas volunteers might have longer tenures, but typically give less than one program per week. While one could argue that permanent staff would be more experienced and talented than volunteers or interns, permanent staff was limited to one or two people at each site at any given time, and these staff gave a limited number of programs, instead assuming managerial roles. Thus, even if experienced educators give more detailed, better structured programs on average, each site had educators with diverse experience, so quality differences across sites were difficult to detect.

Third, variations in staffing structures blur the lines between volunteers, staff, and interns across sites. For example, while one might expect volunteers to be less beholden to the mission than staff, nonprofits that are volunteer-based tend to require greater adherence to mission than more professionally staffed organizations (Hutchins et al. 2003). Indeed, the culture of values adherence is the strictest at CTR, where volunteers conduct almost all education programs. Also,

in environmental education, seasonal staff tend to be low-wage employees, and low-wage employees and volunteers are similarly motivated to gain skills that might be useful for future employment opportunities (Riggio, Bass and Orr 2004). Thus, I did not detect any confounding patterns based on the use of different types of labor at each site.

3.3.2. Individual educators

I also did not detect any patterns at the individual level large enough to negate across-site comparisons. This is not to say that the individuals exert no influence on their content; rather, the individual influences show no discernible pattern other than being individualized. Take for example, one educator who is a self-professed “cat person”:

“And those gorgeous ear tufts are used to communicate in tall grass. The mother communicates with the babies with those ear tufts. As long as the ear tufts are up, the babies will follow mama. And if she drops those ear tufts, the babies go flat. And they wait until they can see those ear tufts again before they'll get up and follow her. That's how they know it's safe.” (CTR LAIE 27)

Contrast this to the exact same fact conveyed by another educator who claims to be more interested in the science education component of the work:

“So scientists aren't 100% sure what the tufts are used for, but they have a couple hypotheses. They think that maybe when the caracals have their babies, when the mom is walking along and the babies are following, if they can see the tufts and they're up, they know that it's safe, and they can continue following along, playing, tumbling around, that kind of thing.” (CTR LAIE 200)

In these quotes, the first educator highlights the beauty of the animal, whereas the second educator highlighted the scientific debate of the fact in question. However, both educators are making a very similar point about ear tufts. In short, while each educator's background and patterns of speech are complex and unique, the individual-level signal is much weaker than the differences across sites, as I show with the program data in the LAIE section. Additionally, research in mass communication suggests that organizational constraints may outweigh

individual beliefs in shaping messages (Shoemaker and Reese 2011), leading me to focus primarily on organization-level comparisons.

3.3.3. Educator goals

While the organizational influence may be stronger than the individual, educator goals are still important because they a) reflect their training and instructions within the organization, and b) can serve as standards with which to evaluate goal attainment (Carleton-Hug and Hug 2010). Educators at all three sites described goals that were site-specific (focusing on furthering the specific organization's goals) and goals that spoke more to the general principles of inspiring awareness, appreciation, and action, which speak more to a general EE framework (Hungerford and Volk 1990). These goals also map onto the VBN framework in that they all include a focus on the threat to a valued object, and then the ascription of responsibility for the correction of this threat. In this section, I first outline institution-specific educator goals, and then I elaborate on trends across sites.

Carolina Tiger Rescue

At CTR, where the institutional actors are much more explicitly focused on the core values of the organization, the educators cited the communication of these values as the most prominent goal for their LAIEs. For example, when asked what the most important messages are in their programs, this educator responded almost verbatim with text from CTR's values statement (CTR 2012):

“We communicate our core values which are no private ownership of animals, no captive breeding outside species survival plans and not using animals for entertainment purpose only.” (CTR Educator 555)

When I asked this educator to elaborate, the answer still falls very much in line with those same values, but they also added a small statement about the ecological significance as well:

“I think the main thing they need to know is these animals are very beautiful and cute but they are not pets. And um that I want them to be in support of laws against private ownership of these animals I want them to realize that what we do all over the world affects these animals and that people tearing up the environment is affecting these animals. And the loss of these animals is also affecting the environment. So you got a vicious cycle, that we are destroying the environment and killing these animals.” (CTR Educator 555)

This educator evokes several ideas that map on the to the VBN chain: inappropriateness of human dominion (part of the NEP), ascription of responsibility, making the connectivity between the individual and the wider environment, and the threat of ecological catastrophe.

These similar goals were echoed by other educators, and CTR educator responses to this question aligned closely with the mission and values of CTR:

“That the animals, wild animals, shouldn’t be kept as pets or be kept within private ownership. And essentially that they shouldn’t be used for entertainment purposes. They should be left in the wild where they belong. That some of them are severely endangered and, people need to be aware of what’s going on with them. Those core messages of the place.” (CTR Educator 557)

“My hope is that we increase awareness about how often these kinds of animals are kept as pets and why they shouldn’t be. And, again, to realize that not all places that call themselves sanctuaries are treated equal.” (CTR Educator 556)

These welfare-oriented messages again reinforce that CTR’s educational content is most focused on an individualistic welfare perspective, in which animals deserve a right to a good life, ideally one in the wild, but for these animals who have been bred for entertainment, a wild existence is not possible. Primarily, the threat to the animals is communicated using captive hazards, and the ascription of responsibility is to agree with CTR’s values on this topic. However, it is also worth noting that two of these educators mention threats to animals in the wild, indicating some desire to link these animals with issues in the wild, which represents a unifying goal across sites.

Duke Lemur Center

At DLC, educators focused on two related concepts. The first is the threats to lemurs in the wild, and the second is the work DLC does to ameliorate those threats. These quotes show how tightly intertwined these concepts are, as most educators mentioned both in their answer:

“I hope that they leave with a sense that what the Lemur Center is doing is very important, so that whether I talked about conservation or talked about research that's ongoing, they at least get a sense that what we're doing is important. We are not just doing it because we're a University, and that's what universities do. That they feel like we actually have a stake in the animals, which we do. We feel like we do. And then, I guess I want people to understand... To give people a sense of what conservation looks like.” (DLC Educator 51)

“I know the most important thing that we have to get across is that... we're trying to conserve the lemurs and the habitats in Madagascar, I know that's really important, and our research too.” (DLC Educator 48)

“So there are several things I am trying to hit people with. There's one, is the evolutionary biology, the radiation from one group of animals into the 70-100 we have now, why did that come about? And then presenting the current conservation problems, the issues that the lemurs are facing, and then I try with the last part, the more hopeful part, is what can we do about this? And then talk about the conservation efforts that are going on there.” (DLC Educator 575)

“I try to make a really big impact on the sign just the sort of effects the people have had on the forests, the deforestation, especially on how important lemurs are to the forest, different adaptations that lemurs have, that really make an impact on the forest, that really is important, and why it's so important that we hang onto species like this, why the forest is so important, why 50 different plant species going extinct is important.” (DLC Educator 539)

These quotes both highlight the Madagascar-focus of DLC, but also speak to the more general conservation goals DLC educators hope to tap into – understanding the consequences of losing endangered species. In these quotes, the threats to lemurs primarily exist in the wild, and DLC is ascribed responsibility for mitigating harm to lemurs.

North Carolina Aquarium

At NCA, three key themes stood out the most among educator goals. First, programs have to be fun:

“I mean, first thing first, it's gotta be fun. These are tourists most of them, some of them are school groups, but a lot of people we work with are family tourist groups and we want them to have fun because if they aren't having fun they aren't going to remember it, they're not gonna take any further steps to protect the resource if they aren't first exposed to it in a fun engaging way.” (NCA Educator 97)

“Every program needs to be fun. Like period. Because if people aren't having fun they're not learning. And every program has to have a take home conservation message. Because otherwise

what's the point in filling their heads with this somewhat random, somewhat useless information about natural history or biology if they can't relate to it?" (NCA Key 509)

As a vacation destination, this "fun" goal permeates everything NCA does, partly because NCA's programs are competing with beach time. Nearly every educator at NCA mentioned this fun requirement. However, fun alone is not the goal; educators and key informants emphasized that fun is a pathway to learning and taking action on behalf of the environment:

"Well, the overall message that I try to share regardless of the program is that when we look to the natural environment, historically, what we've learned is that when we manipulate and mess with nature it comes back to bother us down the line. So, because of that, we need to tread lightly." (NCA Key 514)

"Appreciation for not necessarily just the animals that we talk about, but the environment in general. And just sort of why [the environment is] important, I guess would be, would be a good thing...And then I would say after that, conservation." (NCA Educator 519)

While fun and pathways to action represent broad, overarching goals, NCA educators stated the importance of conservation messages, which can be considered a specific type of information within the first two themes. Nearly every educator at NCA discussed the importance of conservation messages involving turtles. Educators view the turtles as valuable education companions because turtles in particular serve as a gateway to caring about other things too:

"Preservation probably; wildlife preservation. Especially with the turtles because they're so frickin' cute. Everyone loves a turtle, and it's an easy message to send to people." (NCA Educator 92)

"So sea turtles are a flagship species, people care about them, they think they're cute, and I think that people connect to sea turtles, And so, I'm hoping that by helping them to further connect with sea turtles, then that will increase their interest in the other species as well. Like, hey, well, if you wanna do this for sea turtles, sea turtles need help with this, this affects other species as well, and so." (NCA Educator 516)

NCA educators see education not just as a means to promote animal conservation, but as a means to promote environmental awareness and action. Again, like the DLC and CTR educators, there is an explicit intention to tie these animals to greater conservation issues in the wild, and not just

focus on the specific problems with these species or individuals. The valued object itself is the general environment, and thus the threats remain general, as do the behaviors to help (although the learner is cast as the agent in this case, not NCA).

Trends across sites

In addition to site-specific goals, I also found overarching educator goals at all three sites. These overarching themes speak to the similar opportunities and constraints across sites, as educators across sites have opportunities to connect people with animals, but express some reluctance to establish overly specific conservation behavior recommendations.

“Awareness, Appreciation, Action”

Educators at all three sites stated the general goal of increasing awareness and appreciation, leading to subsequent action. This general goal lies in contrast to specific goals because it is framed as learner-driven, without explicit behavioral directives. The prevalence of this goal reinforces the importance of caring in motivating pro-environmental behavior (Allen and Ferrand 1999). Looking at quotes across all three sites, the language is not site-specific:

“That's why I look at it as more of kind of giving people ideas and planting seeds. And I really believe, I mean, for long-term learning, and probably opinion changing, a person has to do something themselves. Whether that is after they leave, they go read more- they have to do some cultivation for that opinion to stick, it's not just me telling people what to think or believe.” (CTR Educator 70)

“Just awareness. I mean, cool facts are one thing, I will tell you as many cool facts as you want, but in the end I want you to do something with it. I want you to take the information I have given you and spread it out, and do something with it, and that's ... I don't know. That's the most important thing to me.” (DLC Educator 539)

“I am one of the people who still really believes in what our core mission statement is - which is, we provide this facility for people to come and see these animals up close and learn about these animals and gain as much information and sort of a feeling for them as they can in here, in the hopes that then they will- a) not try to mess with them in the wild, and b) develop an appreciation and respect for them and have then a greater respect for the environment and just be more

conscious about how they should interact with the Earth and how they choose to live here.”
(NCA Educator 86)

While the NCA quote does mention one specific behavior (not messing with these animals in the wild), these educators state both directly and indirectly that the educator cannot decide how the visitor is going to use the information. Translated into the VBN model, the educators have general goals for the establishment of environmental values and the ascription of responsibility to the individual, but they don't provide information to facilitate action competency in any particular behavior.

“You can't reach everyone”

Educators across all three sites considered success to be best measured not by whether you can affect all of your audience, but instead if you can affect some percentage of them, even just one person:

“The majority of the people that come on these tours are just interested in seeing the big kitty cats. I mean, let's face it. It's reality. But, I think that even if there's just a small percentage of people, say one or two people on each of the tours, that either become a volunteer, an adoptive parent, they donate to our food fund, or come out and hold a hammer. I've been doing this for six and a half years, so even if I have only one or two on each tour, that does something.” (CTR Educator 565)

“And, you hope that out of the 15 people that came on a tour, at least a few of those will go away with some sense of responsibility and want to do something to help the animals.” (DLC Key 133)

“Even if some of the people don't like it, if there's one or two people who are just like, ‘this Behind the Scenes tour has made an impact on me, has made my life better in some way’... it's how I gauge that I'm doing the right job, a good job.” (NCA Key 92)

While the goal of substantively impacting everyone on the LAIE may be unrealistic, the common denominator of one or two people falls almost on the opposite end of the spectrum in this regard, in that the expectations are barely above zero.

Perceptions of limitations

Educators frequently do see connections between their own programs and the development of general environmental values. However, at the same time, most educators struggled to see how explicit general environmental/conservation messages would actually fit into their programs. In interviews in which I asked whether the educator establishes connection between this animal and general conservation concepts during LAIEs, all educators indicated that they do not make these connections. Even though the educators hope that people develop a conservation ethic, they consider explicit mention of general conservation issues to be tangential, perhaps even boring:

“I guess it would be kind of random to just say stuff like, [here are] some of the ways to save the environment!” (DLC Educator 48)

“I’ve found that I don’t like to go on and on about conservation. Because I feel like people, they start to hear me going on and on and on about conservation, they close their ears and they say, ‘Oh my God she’s going on this tangent.’” (NCA Educator 519)

At CTR, a few educators also mentioned that with the limited tour time, they already struggle to include all of the other required information on institutional values:

“I think it's more like, I don't feel like I can [bring in bigger environmental concepts]. Just because I feel like there's this expectation for us to get as much of the required information out on the tour about all the animals, and you know I've talked to other tour guides about this, 'cause you know one of my concerns is ugh, I know so much information but I don't want my tours to go super-long... [I need to] talk about all these things that the Tiger Rescue focuses on, like its mission, its core values, and kind of reinforcing how these different animals came to us, and what we are doing for them, and how it supports the mission and values. So I just feel like there's not a lot of wiggle room.” (CTR Educator 77)

Across sites, I find that educators are interested in inspiring conservation behavior, but are somewhat reticent about providing specific behavioral suggestions.

These unifying themes across education programs serve as the level of outcome analysis for learners. I maintain a broad scope on the definition of program success because educators across all sites express similar goals of instilling appreciation, awareness, and action in learners,

but without strong behavioral specifications for what constitutes a pro-environmental action. In other words, any pro-environmental behavioral change is considered a success in that it results from a visitor becoming appreciative and aware enough to facilitate a desire to take action on the environment's behalf.

3.4. VBN applied

The previous two sections about the institution and the educators provide the backdrop for the VBN framing of the LAIEs in the next section. Institutional data suggest that the three organizations share unified goals of developing an environmentally minded and animal-aware public. However, the communication of values, beliefs, and norms at each of the facilities differed based on each sites' unique combination of mission, animal type, and organizational structure. In my comparative analysis, the VBN framework proves to be useful on two different levels: first, I used it to provide structure to a general framework for VBN in LAIEs that is applicable to all three sites, and second, I constructed a separate typology for each individual site based on its unique characteristics.

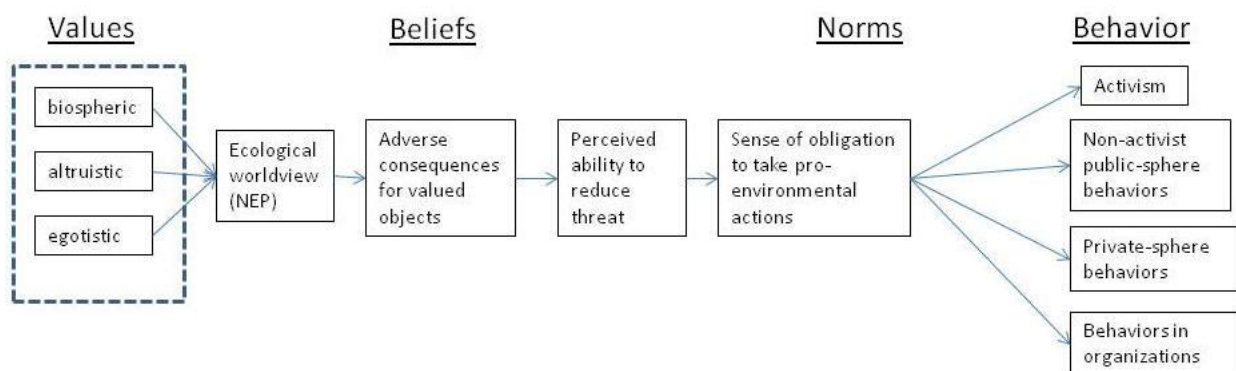


Figure 3.1. VBN model, from Stern (2000).

3.4.1. General VBN Typology

I find that animal-themed education across all three sites shares a common basic format for expressing VBN. While the educator may not explicitly state all elements of the path or discuss the elements linearly, there is an overarching way that VBN maps onto animal-themed education. First, the educator would first present data that supported the value of the animal, in terms of its cultural, ecological or personal relevance. Second, the educator would mention some specific beliefs setting the stage for care, perhaps including the inappropriateness of human dominion over nature or the need for balance in nature (both elements of the NEP). Third, they would establish some kind of threat to the animal (awareness of consequences). Then, they would propose or describe some mitigation activity that could be taken on by an individual or group (ascription of responsibility leading into behavioral norms). If the responsible agent is the individual, then ideally they would propose a way that person can be involved with that mitigation activity, but if the responsible actor is government or other organizations, the individual can support the activities of larger actors. I refer to this linear VBN application as a VBN chain or VBN pathway. While the original VBN framework was intended to capture broad trends in environmentalism (Stern et al. 1999), I argue that the general concepts in the VBN pathway can be applied to animal-specific contexts and represent a specified way to promote individual behavior change. Understanding how VBN messages are conveyed in education programs can help get at the mechanisms with which LAIEs activate environmental values, beliefs, and norms to encourage change.

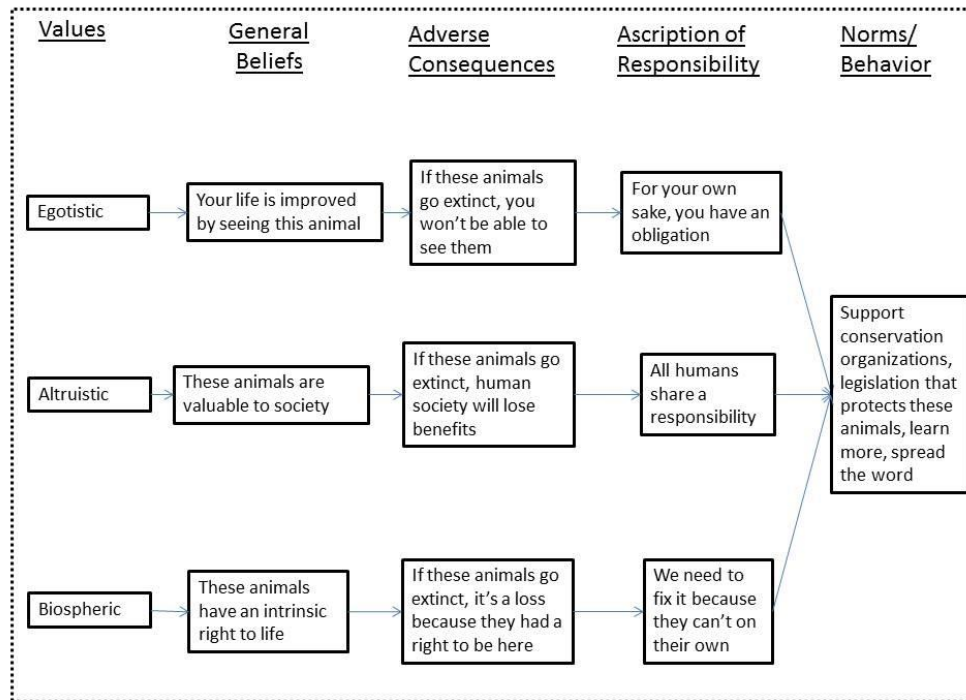


Figure 3.2. General VBN typology for LAIEs

The three different VBN pathways I present in the general VBN typology for LAIEs (egotistic, altruistic, and biospheric) were all utilized in some form at all three facilities. While the original VBN framework splices values and then only provides one trajectory into beliefs, I argue that there are separate trajectories all along the chain until behaviors, where any number of behaviors might be able to help the valued object. Not only does the behavior depend on the animal and the specific threats it faces, but one could also engage in general resource conservation behaviors when inspired by an individual animal, in which case the behavior is not specified by the animal.

The egotistic VBN chain

The egotistic VBN chain was evoked when an educator stated or implied that the human viewing of the animal is the important phenomenon at hand. When the guide mentions how lucky the people are to see the animals, or when the educator makes comments about trying to

get the animal to come so that visitors can get a better look; these things demonstrate that the individual's needs are the most important priority. Educators used visitor-focused language at all three sites. For example, in 2012 the staff tour guides at the Lemur Center were giving Craisins to the animals, the point of which was to get the animals closer to the visitors:

“Now you may have noticed I brought these treats along with us this morning, this is so that I can lure the lemurs closer to us, these are Craisins, and they're pretty sweet so it's not something we would give to them as part of their normal diet, but it's really good as treats, or in training, or anything like that, so in order for you guys to get a better viewing I'm going to be handing these out a little bit.” (DLC LAIE 11)

Similarly, some CTR guides feed the animals treats:

“Apparently she's not going to come out too far. [Becky in den box] Let me try, I've got one more piece of banana, see if I can get her out a little bit further.” (CTR LAIE 25)

NCA educators can take this one step further by allowing guests to touch some of the animals:

“This is an alligator, an American alligator. So North Carolina is about the farthest northern range for American alligators. They get up to the northern Outer Banks, that's about as far north as they go. If you guys want to come up you can touch him on the tail [kids came up] I got 'em, he's not going anywhere. [more chatter] He's got really strong jaw muscles for closing down; he has really weak muscles for opening up. So I can actually just hold him with my fingers on his nose and he wouldn't be able to open his mouth.” (NCA LAIE 79)

In these moments, the educator is reinforcing that the visitor experience of getting close to the animal is important. However, while egotistic experiences on tour may lead an individual to feel compelled to help these animals for egotistic reasons, educators never stated directly that the animal should be protected/conserved for the learner's personal benefit.

Educators from all three sites also commented during interviews on the need to connect visitors on a personal level with the animals and concepts. This goal speaks to an egotistic orientation, even though the end goal is to get them to expand their moral obligation to animals and the environment. One NCA educator sums up the need for personal relevance:

“But a large part of what I found historically doing the work that I do, is you want to reach people and get them to make a difference you have to be connected to them, you know? It's fun

to share facts and it's fun to do the live animal program where it's a cute animal and the kids are having fun, but if you really want to reach people you have to connect it to something that is going to affect them. So, that is why we end up doing so much of that." (NCA educator 97)

During interviews, educators stated this goal of making personal connections with the audience, but this goal serves more as an undercurrent to the program as opposed to a curricular item.

However, not all educators saw this act of connecting visitors to animals as a purely positive venture – educators at all three sites voiced some internal conflicts about it:

"That's the whole issue with it, it's about people, they want this pleasure, they want this diversion. Even me! A person who volunteers and is aware of this stuff, still when I think about going to the zoo I think about- I want to go see it! I want to see it, I wanna look at it, and that kind of stuff, it's still about me. And you know you can wonder whether all of these great videos, you know National Geographic programs, and all sorts of other things, you know, is that not sufficient? Why do we still feel like we have to see it with our own eyes? Even if it's in a cage or in an aquarium?" (CTR Educator 70)

"I don't like seeing animals in captivity at all, but you wanna give them the best life that they can while they're there, because they're the ambassadors. They're gonna get people to care about the environment. They're gonna get people to care about their plights...but they're there and you can just hope they get their point across with palm oil or deforestation." (DLC Key 133)

"I don't like sea turtles in captivity, but I know the ones that we keep, there's something wrong with 'em. And most of them are gonna be released. So I'm okay with that. But, I honestly don't like using a sea turtle for programs. Cause I feel like when it's a good way, we use it as an ambassador, but I feel like we're kinda using it for birthday parties. Birthday parties kill my soul a little bit. [Laughter] I'm not gonna lie...I feel like you're more of an entertainer versus an educator. I'd rather be seen as an instructor person, like I try to make it fun and funny. But, I don't like when I'm just there for somebody's amusement. Like, instead of hiring a clown they hire somebody from the aquarium to come in with animals." (NCA Educator 515)

The altruistic VBN chain

Educators evoke altruistic values by discussing the value of the animal to human society. In this pathway, human society will suffer if these animals go extinct, and the ascription of responsibility falls to society as a whole, including (but not limited to) the individual who is receiving the message. Educators at all three sites had opportunities to discuss the altruistic value of their animals, although the value of different species is constructed based on pre-existing societal values for those types of animals.

At CTR, while the animals are referred to as beautiful and wonderful frequently, their need to be wild overrides any argument that these animals are *valuable* to humans because of their beauty:

“Some people are finding their kittens are a little more wild than they would like them to be, but this is the wild half that it's coming from. They make beautiful kittens but they are still meant to be wild.” (CTR LAIE 25)

Instead, CTR educators emphasize the value of the animal *in the wild* to humans by making a connection between ecological services and human benefit:

“The reason they are so important is they live in the Southeast Asian rainforest. The rainforest is made up of a tree called the strangler fig. Binturongs, these beautiful guys here, are the only mammals known to have digestive enzymes capable of softening the strangler fig seed coat, so they eat the fruit of the strangler fig, it passes through their digestive system, and when it comes out at the other end, which I will leave to your vivid imagination, it's germinated and ready to sprout. Without binturongs, the strangler fig would die. The rainforest canopy would die. Everything under it would die. The rainforest would die. And since rainforests provide water and oxygen to the planet, we'd kinda like to keep those! So that's why binturongs are the most important animals you never heard of!” (CTR LAIE 27)

Note that this passage includes the establishment of the ecological value, the general belief that these ecological functions are valuable to society, and a short mention of adverse consequences and ascription of responsibility (“we’d kinda like to keep those!”).

At DLC, the value of the animals to human society includes their ecological function as well, but the captive population also has additional value as research subjects:

“Something kind of interesting about these [mouse lemurs] is we’re actually doing a lot of age studies with them right now, because they typically live about 14 years, and what we notices is, they age similarly to humans. So their metabolism slows down, they gain weight, their hair goes grey, and they also get Alzheimer’s. Which, we don’t really notice symptoms of Alzheimer’s, like dementia or anything. We typically don’t even know about it until afterwards and we do an autopsy and we do a brain scan. But we do actually have an MRI machine here, so we can give them MRIs and see their brain patterns. And the reason we study them is because they’re so closely related to humans but they have such a shorter life span, they’re easier to study than obviously people who can live beyond 80 years. So, we do a lot of studies with them.” (DLC LAIE 150)

While research at the center also benefits the animals, lemur research that benefits humans is a key topic at DLC, casting DLC as the key agent capable of conducting research for human/animal benefit.

At NCA, educators most commonly frame the value to humans using the animal's state-centric relevance:

“Again, a lot of our actions unknowingly do affect these animals and that’s why we’re really lucky that they thrive at places like Cape Lookout, Cape Hatteras – these are part of the national seashores, a really good balance in North Carolina of development and protected habitat. So we’re fortunate to have that.” (NCA LAIE 98)

This educator emphasizes that we are lucky to have the animals near us, which is a human-centric view but also an opportunity to emphasize the balance between preservation and management.

In other cases, NCA educators emphasize the economic value of certain species:

“A 1400 pound Blue Fin Tuna will go for \$100,000. Not only is that enough to pay for all your gas, all the maids, all the captains, all of that stuff, but you still have so much left over after that. For one fish! One fish! Just because they overfish their population in the Pacific. But it really is the craziest thing. We’ll come back in off the boat, you know we radio in; we want to weigh this tuna and everything. So we get to the weighing station and there’s always like a Chinese or Japanese businessman sitting there in his nice suit has a shiny briefcase there that has like seriously \$100,000 in cash for this fish. Like how awesome is that? Good for our economy too, so yay for not overfishing our population!” (NCA LAIE 105)

This quote represents an example of an educator who has stated several components of the VBN chain explicitly: they mention of the value (financial), the adverse consequences for hurting the population (Asia’s example), and finally our congratulations for not overfishing (ascription of responsibility, establishing responsible management as norm).

The biospheric VBN chain

Biospheric values are perhaps the most tenuous construct of the three, as our unavoidably human perspective makes genuine biocentrism difficult to achieve (Watson 1983).

Acknowledging this limitation, I considered the biospheric pathway to be evoked in three primary ways. First, educators most commonly expressed biocentrism in the captive context by emphasizing that the animal's needs come first. Educators at all three sites consistently framed animal care in this way:

“So it's a big part of the aquarist job to figure out what animals like to eat what food to keep them healthy and happy.” (NCA LAIE 79)

“I mean this is now their home, we're just visiting it, so if an animal doesn't really react well to being visited, doesn't like large groups, we had a tiger that didn't like getting his picture taken from his previous experience- they just kind of stay off tour.” (CTR LAIE 32)

“As you can see there, they have these holes in here and they have an indoor room on the other side so they're allowed to decide whether they want to be in or out.” (DLC LAIE 535)

In these passages, educators reinforce the belief is that these animals deserve a good life, and that the ascription of responsibility is squarely on this organization, not on the learner. While I coded this as biocentrism, animal care as biocentrism is a limited construct given that keeping animals captive is a human-centric endeavor.

The second way I coded biospheric values was when animal is framed as having the primary perspective or agency in a story (which was rarely stated overtly), such as this passage:

“Becky? Would you like some banana Becky? Were you hungry? [Man: well he's not pretty I'll tell you that!] Beauty is in the eye of the beholder. To another binturong, she's gorgeous. [Crowd: aww!]” (CTR LAIE 55)

In this quote, the educator implores the viewer to consider the animal's perspective, although educators risk anthropomorphizing the animal when using this lens.

Third, I coded a passage as biospheric if the educator spoke of the ecological value of the animal *without* reference to the value to humans. While the information might be similar to the passages coded for altruistic value, this distinction speaks more to the real difficulty of separating out eco/anthropocentric motives when there are co-benefits (Gagnon Thompson and

Barton 1994). In the following example, even though this quote speaks to the ecological value, I coded it as “biospheric” instead of “altruistic” because it does not make any reference to the value of the apex predators or ecological services to human society:

“Binturongs eat the fruits of the strangler fig tree, which provide the canopy of the rain forest, and when the seed goes through their digestive system, they have a special enzyme that softens the seed coat and allows it to germinate, when it comes out the other end. If the seed falls directly from the tree, onto the ground, it can't germinate, 'cause the seed coat is too hard, it has to go through these animals' intestines, so this animal is crucial to the survival of the rainforest. Very important animal.” (CTR LAIE 180)

While this quote is similar to the binturong quote I coded under altruistic values, the difference is the educator emphasizes the value of the rainforest itself, *not* the value of the rainforest to the human. However, as the fact has been conveyed in a context where a group of humans are observing an animal in a cage, all three of these forms of biocentrism demonstrate the limit of biocentrism in practice, especially in institutions where animals are kept for humans to see.

3.4.2. Specified VBN typology

All three organizations use egotistic, altruistic, and biospheric concepts in their educational content, and at all three sites, animals are the valued object. So the more interesting question becomes, how are the animals constructed as a valuable object in each context? Each site, based on a combination of its mission and the type of animal they house, constructs the meaning and value of the animal in a different way, and the value of the animals affects how they encourage the expansion of one’s moral obligation to animals and the environment. CTR is most focused on the value of the individual animals, DLC values lemurs as an interesting and rare cluster of species deserving of scientific inquiry and conservation, and NCA emphasizes general aquatic systems, caring for animals as part of the local ecosystems and as part of the habitats in the aquarium. I must be clear that I am not arguing that these organizations do not value the animals at other scales; the point of this distinction is to highlight the *primary* value

emphasis at each site and explore how those values translate into LAIE content. Figure 3.3 outlines the primary typology communicated at each site, in which these different values constructions lead into specific beliefs, which lend themselves to advocating for specific behaviors. In the next section, I work through the concepts in this typology using LAIE data as examples.

The LAIEs

The LAIEs provide support for the specified VBN typology at each site. While there are some different activities during each program, all three sites use a similar tour format, in which educators lead visitors through the organization's facilities, stopping at key interpretive points along the way. While there was some variation on the tour format for the specialty tours that all three facilities offer, in this section I focus on the main tour for each one: the general public tour at CTR, the Lemurs Live! Tour at DLC, and the Behind the Scenes tour at NCA.

I identified ten types of information that are comparable across all three facilities. These ten categories represent the topics of information covered at each site; while there is some overlap across these areas, I chose to highlight these categories because together they cover all of the major thematic content of education programs across sites. Thus, these ten categories create an opportunity to compare the ways in which educators at each site communicate VBN concepts. I attempted to classify the ten categories by their location in the VBN chain, but these categories show substantive overlap in practice (Table 3.6). Despite the limitations of these categories, they help one think structurally about VBN in LAIEs.

LAIEs at all three sites go into places that are not designed to be freely explored. Thus, educators start each tour with a brief overview of rules and things to watch out for (stay with the guide, no running and screaming, camera rules, stay behind ropes/fences, keep hands out of/off

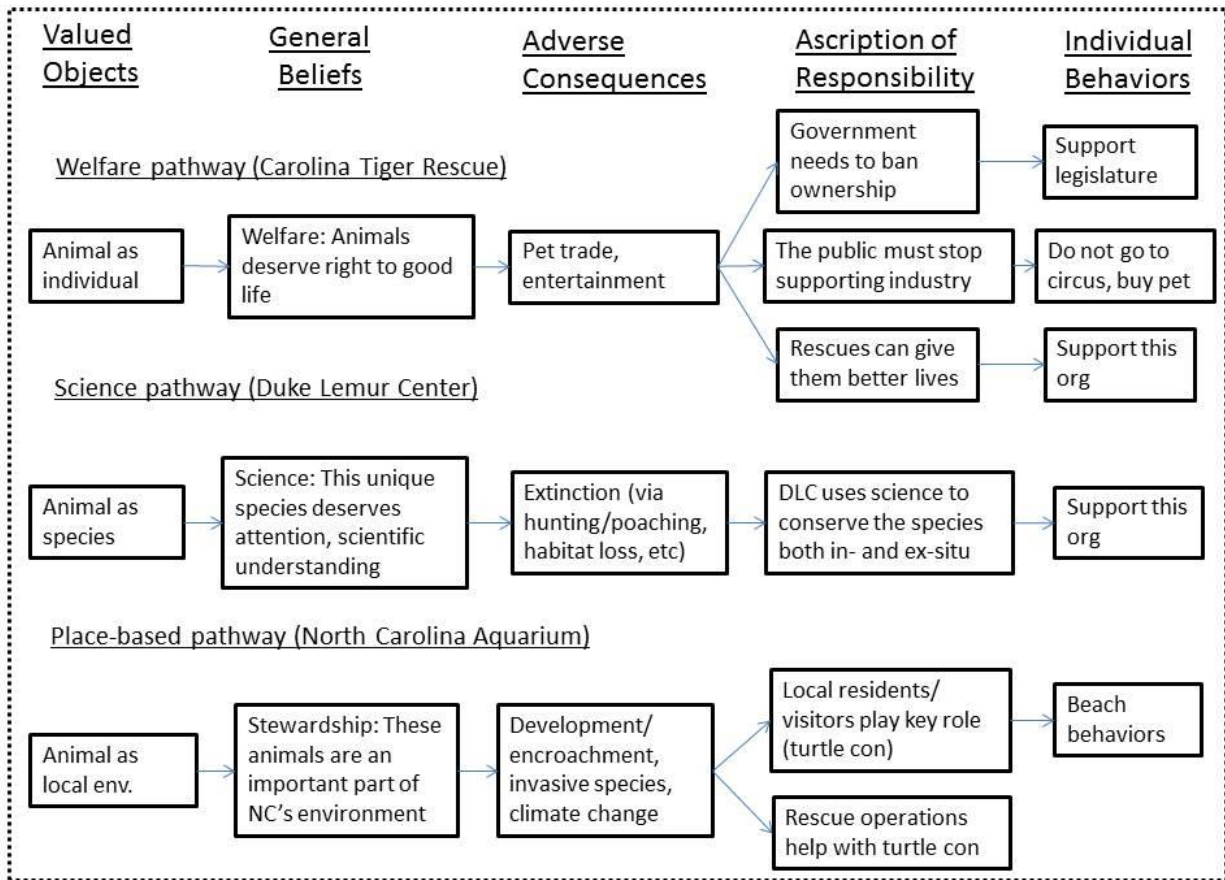


Figure 3.3. Specified VBN typology

Table 3.6. Basic classification of VBN messaging in education programs

	Valued Object	General Beliefs	Adverse Consequences	Ascription of Responsibility	Norms/ Behavior
LAIE info type:	1. Safety 2. Natural history 3. Animal Stories	4. Not pets 5. Ecological significance	6. Threats to animals	7. Quality of care 8. Conservation efforts	9. Asking for help 10. Behavioral directives

1. Safety

enclosures). Addressing safety concerns satisfies the bottom rung of Maslow's hierarchy, allowing for more focused engagement (Maslow 1943).

Even though this is a straightforward category of information, the educators already display differences in how they construct the animal's value. First, CTR educators couch safety rules in

the animal's wellbeing, enforcing the idea that the individual animal's experience is as important (if not more so) than the visitor's:

"Kids, I'd like you to watch your parents no running, screaming or yelling, because you could trigger a prey response in these animals. They are living in captivity and there's enough stress with that that we don't want to upset them anymore." (CTR LAIE 193)

DLC educators also mention the need to stay together, but educators do not frame this fact in terms of lemur needs:

"A couple rules before we go down: we're going to stick together, so if you see a lemur that we haven't come to yet, we might not go visit it- not all the lemurs are supposed to be on the tour path. You can take lots of pictures, lemurs are very photogenic but they do not like the flash, they have a reflective lens in their eyes that makes them very sensitive to that." (DLC LAIE 47)

Even when the DLC educator makes a point that does touch on animal welfare (they do not like the flash), they frame it using a scientific justification (the reflective lens on lemur eyes).

In contrast, NCA educators make no mention of animal safety. Instead, their opening safety speeches focus on the needs of the *people* who take care of the animals:

"So we'll go back behind the scenes. It's not gonna look like it does right here. It's not gonna be carpeted, out here it's made more for the guests. When we go behind the scenes, it's made more for the, aquarists and the people that take care of the animals. So there could be concrete floors, could be wet, could smell a little funny back there from the fish." (NCA LAIE 158)

While the NCA speech is not disrespectful to the animals, NCA educators do not attempt to ensure animal safety during the human safety lecture.

2. Natural history

All programs include some element of natural history. This category of information includes what the animal eats, where it lives, how much it weighs, some "fun facts" like how an octopus can die of boredom or that a caracal can jump ten feet in the air to catch a bird, or that females are dominant in most lemur society. This type of information subtly conveys animal value, because spending time discussing its characteristics and habits implies that the animal

deserves one's consideration. Educators shared animal facts during all LAIEs, most commonly including information on age, size, diet, range, etc. This was also a popular subject of questions from visitors.

At CTR, even when disclosing general facts, educators often managed to evoke an animal welfare lens:

“So the gestation period the mother is about 100 days. That's because the mother is solitary, she's living on her own, just like all of these tigers, so they're living on their own, they have to be able to hunt and care for themselves. So they can't be pregnant for a long time. So they give birth, there about 2 1/2 pounds, by the time they're three weeks old they're eating meat, by the time they're six-month-old there are anywhere from 50 to 80 pounds, and they're gaining a pound a day. So that's about the time a lot of people that own these animals as cubs realize it's probably not a very good idea.” (CTR LAIE 29)

At CTR, any information about the animal's strength, size, or behaviors can be used as evidence that these animals should not be pets in captivity.

In contrast, DLC educators spend a lot of time on this same topic (gestation and birth), but they do it in the context of talking about their own breeding program:

“Now most lemurs, I mentioned we have lots of baby lemurs here- most lemurs only have one baby a year. Some will have two babies a year. These guys actually will have triplets. And we know that they can give birth to up to six! This is one of the only primates we know of that will actually give birth to a litter of offspring.” (DLC LAIE 13)

The DLC educator also takes the opportunity to connect the visitor to the lemurs using our shared primate origins.

At NCA, in line with the state wildlife focus, the natural history is frequently related to the topic of North Carolina:

“Here in North Carolina, our alligators average about 6 feet long. The largest adult alligator was around 12 feet long, documented in our state. Down in Florida they get that big all the time, they average around 10 feet long. And of course, the main difference is it's much warmer year round in Florida. Here in North Carolina, there's at least 4 months out of the year usually we're experiencing temperatures that are too cold for the alligators to be real active. So they kind of get lethargic, they don't eat very much during the winters, and if they're not eating very much

they don't grow very large. They are limited in their size, because of their habitat here.” (NCA LAIE 169)

When possible, educators at all three sites tie natural history information back to the mission and activities at the center, which reinforces the value of the animal as a representative of their core institutional principles.

3. Animal stories

Educators at all three facilities describe the lives of the animals in the facility in some way, and this presents another opportunity to construct value for the animal. CTR educators tell the story of how each individual rescued animal on the tour came to the facility, often in great detail. For example, educators always describe Elvis Serval's story quite thoroughly:

“Elvis was literally dumped on our front doorstep. There was a woman who called our office and talked to a staff member and said that she had a friend who had a serval that she'd gotten afraid of, 'cause he had become aggressive. She had a pet serval. And just imagine a wild animal becoming aggressive. Who knew? Anyway, our staff member told the woman to please have her friend call us, and we would talk to her about taking the serval. 'Cause at that time, our quarantine facility was full of tigers, and we didn't really have room to bring a new animal at that point. Well, the woman apparently couldn't wait, because the next day when our staff member came out of the house, there was a little cat carrier sitting there with a serval in it. There was a note on the carrier that said hi, my name is Elvis, my family can't take care of me anymore, so please love me tender. There's a copy of the letter in the education center, you can see it if you're interested. Unfortunately, the people who had Elvis were not able to take very good care of him. He had apparently been confined to that tiny little crate for a long time, because the muscles in his back legs had withered, and he was wobbling and couldn't jump. He also had collar that had grown into his neck, apparently they put it on him when he was little, and then, when he got older, he was too aggressive for them to get it off of him. So our veterinarian examined him when he first came, and she said, she thought he would make a full recovery, and he has. You can see he's perfectly normal now. He has good use of his legs, he can jump and run, and in fact, a few weeks after he came out to his new enclosure, he killed a snake. So, we were very proud of him.” (CTR LAIE 540)

Elvis's story emphasizes both the value of this individual animal and the adverse consequences he suffered in captivity. By saying “we're proud of him,” the educator indicates that people at CTR care deeply about his ability to live his life without hindrance, fulfilling one of the main organizational goals of protecting wild cats in captivity. The story also highlights CTR's ability

to fulfill the needs of individual animals, establishing CTR as a positive agent of change. The educator even manages to reinforce Elvis's wildness in a sarcastic side comment.

DLC educators cannot tell sad stories about their individual animals' lives because most of them were born at DLC into a high captive standard of living. Instead, educators focus on lemur pedigrees and social groups. For example, educators explained why two of the female ring-tailed lemurs were on the 2013 summer tour path:

"This is Canada Dry and her mom Ginger ale. And earlier I was talking a little bit about lemurs being pushed out of their family groups, well these guys live in colonies. Female dominated colonies specifically. And Canada Dry, when she got a little bit older and a little more mature, she decided she was going to fight the dominant female in their colony, and after a lot of fighting we decided to remove her. The dominant female's name was Sprite, and she's one of Ginger ale's other daughters. So we moved her out with her mom to keep her some company, and currently we're still searching for a male to live with her. And when we do we'll introduce them, and then we'll take her mom and just put her back in the colony." (DLC LAIE 150)

These kinds of stories give the audience insight into lemur society, which a more scientifically oriented avenue for enabling the development of care in the audience.

Finally, animal stories on NCA tours center on how the collection is either bred (in the case of the jellyfish and the sea horses), rescued (sea turtles), caught, or traded from other aquariums.

"So how we get our fish at the aquarium... we can get them lots of different ways. So one way that we can get fish, is our aquarists actually can go out scuba diving, snorkeling. They can go out with nets. They can collect fish that way. They can also go out in our aquarium boat and go with some fishing poles and spend a day out on the boat with their fishing poles, eating chips, listening to music, catching some more fish for our exhibit. We can also get our fish through the mail. We can get fish by trading with other aquariums so lots of different ways that we can get our fish. Once we get them in here, they go into a holding tank or a quarantine tank where they sit there for 30 days to make sure they don't have any parasites or they're not sick. And then once they've gone through quarantine, they go into a holding tank. So these ones are in holding. So we have lots of extra fish in the back because if we have a fish out on exhibit and he gets really old and he croaks, because nothing lives forever, right? We need to make sure we have extra to put out in the tank. So that's why we have so many fish back here." (NCA LAIE 108)

The practice of wild harvesting would be considered unacceptable at CTR or even DLC, although many years ago they began with animals from the wild. This quote articulates the value of the animals as interchangeable specimens and not a community of individuals with their own rights (CTR), or even a collection of highly valuable, scientifically important species (DLC).

4. Not pets!

As for “not pets” messages, all three have some kind of message about these being pets, but as one moves down the chain from individualism to ecosystem, it becomes less prevalent. In other words, the unsuitability of these animals as pets is mentioned repeatedly at CTR, occasionally at DLC, and rarely at NCA.

At CTR, educators emphasized the “not pets” message on nearly every single animal, and they framed it in one of two ways. First, they emphasized how private citizens cannot provide a good life for these animals:

“If you have to maim an animal so it can live with you? You have to declaw it and file down its fangs? Maybe it's not supposed to live with you! You know? Consider that! Because that always really annoys me, I can't believe that vets will actually do that, they'll actually defang and declaw wild animals.” (CTR LAIE 27)

CTR educators also deliver the “not pets” message by evoking the animal’s “wildness”:

“Because they thought it was cute and it would make a good pet. The problem is, just because an animal is cute it doesn't always make a good pet, this is not a domesticated animal that was selectively bred for thousands of years and thousands of generations, this is a wild animal. Wild animals don't necessarily accept people as part of their clan.” (CTR LAIE 544)

CTR educators took almost every opportunity to link an animal’s features, such as hunting and climbing abilities, to their unsuitability as a pet.

While lemurs are sometimes taken as pets, DLC does not work with pet rescues, so educators have no “sob stories” about the pet trade to share; they discuss pet ownership more abstractly:

“And unfortunately that leaves them vulnerable to the pet trade, because people will come in and just pluck the babies out. And what they don’t realize is that when this species gets to be mature and those teeth grow in, they get really aggressive. These are some of the meanest lemurs we have here.” (DLC LAIE 15)

DLC educators also emphasize the threat of pet ownership more as a depletion of the wild population, as lemurs are rarely bred for the pet trade. Also, whereas CTR tour guides mention the no-pets message on almost every species, DLC educators mention it at most twice per tour, on average once per tour. While most of the mentions were phrased like the above quote, a few DLC educators justified the no-pets message by saying only experts can keep lemurs, capitalizing on a small opportunity to reinforce DLC’s identity as a scientific institution:

“Yeah, these guys are really hard to keep alive in captivity, only experts can do it and if ordinary people tried to take care of them they usually get sick, so you don’t want to have the lemur as a pet.” (DLC LAIE 19)

At NCA, educators only presented the “not pets” message using a diamondback terrapin they rescued from a private owner. NCA has both a healthy terrapin and a deformed terrapin, so holding the two of them next to each other provides a great visual comparison of health:

“This is what a normal terrapin should look like. They’ve got that perfectly diamond shaped shell. That really pretty bluish-gray speckled skin. Now, look at this guy. Look how different he looks. He’s deformed, right? So he’s really dark and his shell looks kinda strange. So what happened is this guy was a pet, and you’re not allowed to have them as pets, and he probably wasn’t getting the right water or the right food quality. And so he’s, his shell became soft and deformed. Now, I don’t know how we found out about him or when we brought him here, but I do know that once he got the right water and food quality here his shell did harden. So he’s healthy, but he’ll never look the same.” (NCA LAIE 163)

NCA educators using this example focused on just the nutritional components, not the welfare issues of keeping terrapins in captivity. I must also note that not once in my interviews or tours did welfare issues around privately owned aquariums come up, suggesting that neither NCA staff nor visitors consider this to be a pressing issue for their facility to address.

5. Ecological significance

CTR educators discuss the ecological significance of at least four different types of animals on tours. They discuss umbrella species with the large cats, keystone species with one (or more of the small cats), seed dispersal with the binturongs, and pollination with the kinkajou:

“Tigers are what's known as an umbrella species. Lions fall in the same category. So they don't provide a specific role in the environment like the caracals and the servals do, but they're just kind of a general indicator of that environment.” (CTR LAIE 200)

“Bobcats are a keystone species in our ecosystem, can anyone guess why? These guys are really good at catching rabbits. And what are rabbits known for? Procreating? So that's why bobcats are important to our ecosystem, help control the rabbit population.” (CTR LAIE 29)

“She has a five inch long tongue, if she ever really sticks that tongue out you can see. And one of their big functions in the forest is they're one of the only mammals that pollinates flowers. She'll stick that long tongue in the plant to get the nectar out of it and she'll get the pollen all over her face. She'll go to the next plant and that pollen will rub off.” (CTR LAIE 25)

“This animal helps with what we call seed dispersal, so seeds, like in fruits. This animal, I mentioned before lives in the rain forests, and so it eats this particular fruit called a fig, and it poops out its seeds, and the seeds grow new fig trees, basically, so it actually helps the trees regenerate and grow more, just by its normal behavior of eating and pooping, so not bad for a day's work.” (CTR LAIE 30)

At DLC, all educators touch on seed dispersal with one of the more frugivorous species, and some educators (~30%) discuss pollination using nectar-harvesting lemurs:

“75 to 90% of their diet is actually fruit, so they're some of the most frugivorous of the lemurs. And that makes them good seed dispersers, they have very fast metabolisms, so they'll eat fruits whole usually with the seeds, and then about four hours later the seeds come out in a nice little pile of fertilizer, so it really helps Madagascar.” (DLC LAIE 47)

“A few tree species have flowers that only bloom at night. So they could be eating the nectar and the pollen out of those flowers and then they can also act as pollinators for those flowers, they have really furry faces so they stick that furry face down into a flower to drink the nectar, and they're gonna pick up pollen which they can take to another flower and deposit it.” (DLC LAIE 11)

NCA educators rarely touched on the ecological significance of individual species for ocean health. The only instance I found was a couple of tours on which the educator mentioned

the role of neon gobies, but the point was quite brief, as the tours did not make a full stop at the goby tank:

“These are neon gobies. So neon gobies are kind of like the toothbrush of the ocean, uh this will come up on reefs to what's called a cleaning station-they'll puff out their gill slits, open their mouths, these guys will come through, pick off any extra food or parasites off their gills, just clean them up.” (NCA LAIE 79)

However, the main animals on the tour – turtles, sharks, octopi, a variety of fish, alligators, and jellyfish are not lauded by educators for any particular ecological function. Only the lionfish, with a negative ecological function, is discussed in ecological terms (I will discuss this in the threats section, as information overlaps substantively across the VBN pathway).

6. Threats to these animals

All tours include some attention to the threats to these animals, mostly in the wild but at CTR this also includes those in captivity. The threats to wild animals are similar at CTR and DLC, where educators emphasize habitat loss/fragmentation, the pet trade, and hunting/poaching. NCA educators discuss invasive species, human harvesting, and human activity on beaches.

CTR educators emphasize welfare components of the threats to the animals. During some tours, guides stop at an empty enclosure in order to point out its inadequacy as a space:

“Ladies and gentlemen, let me call your attention to this enclosure here on my left! You think that enclosure is big enough for a full grown tiger? No! Neither do I! Some people think that's just fine! And I could tell you there are some tigers living in captivity in the United States who would think that enclosure right there was a palace compared to what they're in right now!” (CTR LAIE 27)

Not only does this educator use a judgmental tone, establishing her disapproval of this type of enclosure, they also cast tigers as the ones who assess an enclosure, even though in reality, humans make the decisions about captive animal needs. Even when discussing threats to the animals in the wild, the emotional, judgmental tone is palpable:

“One adult serval will eat between 3 and 4 thousand rodents in a given year. Isn’t he a pretty boy? Now one of the main threats to these guys, they are often actually poached. And their pelts are sold as baby cheetah. Now first of all, I don’t know why anybody would want to own a baby cheetah pelt to begin with. But, I think his pelt looks a lot better on him. And second, he looks actually nothing like a baby cheetah.” (CTR LAIE 195)

While this educator describes threats to wild servals, the educators keep these stories relatively brief compared to their descriptions of threats to animals in captivity, which are communicated using the real-life stories of the individual animals on the tour, such as the case of Rajaji:

So, um, Rajaji here started off life as a pet, for somebody in Virginia. After about two years, that person realized they made a big mistake. Now, look at him, he weighs about four hundred pounds. He is small for a male tiger because he was severely malnourished the first two years of his life. He didn’t get to grow enough. Anyway, they gave him up to the Triangle Metro Zoo that used to be in Wake forest, and they nursed him back to health there but unfortunately, they closed down because of money considerations. This often happens, our hearts are bigger than our wallets, it’s a big risk for a place like this. They gave him up to us.” (CTR LAIE 193)

CTR educators frequently mention the closing down of other facilities, which represents an opportunity to highlight the need for cat rescues in general as well as the reputability and responsible rescue practices at CTR. Even when the threat is relatively unrelated to CTR’s work, educators will still make a connection to CTR if possible:

“Now they are endangered because their range is being cut down, it’s being fragmented and farmers don’t like them because these guys can take down prey four times their size. A single caracal can kill a small farm animal like a goat or a sheep or a small pig or a calf, so they get killed even though they are performing a valuable service for those farmers by killing all the rats and mice which spread disease, so that’s one of the reasons that they were brought into the breeding program.” (CTR LAIE 544)

At DLC, educators focus on threats to wild populations as opposed to threats to captive lemurs. However, since lemurs are limited to Madagascar, this also means the types of threats they face are limited to Madagascar. Here is a typical “sign presentation,” in which educators highlight the issues facing lemurs while standing in front of a map of Madagascar:

“Can anyone guess for me who might live in this nice big green area? Humans. Yes. So people arrived on the island about 2,000 years ago, and since then we’ve lost about 90% of the natural habitat on Madagascar...The primary form of agriculture is going to be Tavy, which is slash and

burn agriculture. And what that means is they literally take a section of the forest, they burn it to the ground, which leaves the ground initially with a lot of nutrients to grow their crops on but unfortunately the way that they use the land year after year repeatedly, uses up those nutrients very quickly, and they have to move on to a new space of land doing the same process over again. There are about 22 million people on the island today; you can imagine how devastating this would be to the forest. And lemurs need that natural forest to survive. They are only around the edges where this natural habitat is. Even this map is outdated, this blue area is much thinner, more pocketed along the east coast and this is much more fragmented, we call it fragmented forests because lemurs can no longer get from one section of the forest to the other. They are stuck in their fragments and their pockets in the forest, which makes us worry a lot about the genetic diversity of the lemurs that are there on the island.” (DLC LAIE 525)

Because Madagascar is the only place lemurs live, educators can go into greater detail about the changes occurring on the island. Educators also frequently mention endangered statuses:

“And this is a species that is very critically endangered, it is very possible that this species could go extinct in the wild fairly soon. They are listed in the world’s top 25 most endangered primates, so not just lemurs but all primates in the world, they’re one of the most endangered...and there’s not that many of them in captivity either, the only breeding female in North America is actually Margaret and Presley’s mother, we have her here... and captive breeding for endangered animals is important, it provides a safety net in case the animals do go extinct in the wild.” (DLC LAIE 11)

This educator’s comments on the endangered status of the animal segue into a mention of the breeding program at DLC, which again showcases the responsibility the organization assumes for helping these animals (as well as the fluid borders of the categories I have created).

At NCA, educators primarily use turtles to deliver messages about human encroachment:

“But one of the biggest issues these turtles have, unfortunately, is human interaction. Um, of course, we’re attracted to the beach, the place where they lay their eggs. We love it for recreation but we forget that it is a natural habitat of animals that are protected and in some case, endangered. Things that we do on the beach that affect these turtles...” (NCA LAIE 98)

“So we don’t have very many terrapins here in North Carolina and that’s for two reasons; both are because of people. The first reason we don’t have very many terrapins is because people used to go out and collect them a lot. People used to love to eat turtle soup and there used to not be laws on how many you could take or anything like that. They were overharvested, overexploited... things like that. So we don’t have very many terrapins because of that. The second reason is because of crabs. So fishermen go and catch crabs using crab pots. The crabs like to eat meat and so do these little guys so when they go into a crab pot and they’re done with dinner and they need to get a breath of air, they can’t get out of the crab pot and then what happens? They drown. They can’t go up to get a breath of air.” (NCA LAIE 108)

Because NCA deals with local species, they are able to indicate that the threatening force in the local context is not just humans, but us as North Carolina residents or visitors. However, they still use the collective “we,” which softens the accusation.

Humans are not the only threat to aquatic systems in North Carolina. Educators also used lionfish to discuss the concept of invasive species:

“So if a ship came over from the Indo-Pacific and sucked in a bunch of maybe baby lionfish or eggs, came over to the United States, and was picking up a bunch of cargo and they pushed out all that water, we all of a sudden have a bunch of little baby lionfish. That’s how they think that they got here. Now, I guess that they’re really pretty fish and it’s not their fault that they’re here but they’re doing some pretty bad things to all of our little native reef fish that we, um have. They’ll actually eat up to 80 little fish every single day.” (NCA LAIE 108)

Highlighting an invasive species casts the native ecosystem as the threatened object, as opposed to the individual or the species, which again follows NCA’s mission of local aquatic system focus.

7. Quality of care

Second, all educators heavily emphasize the high quality of care the facility provides. All tours include ample information on how they take care of the animals. This attention to care reinforces the point the animals come first, thus emphasizing the value of the animals, as well as establishing the organization as an agent capable of helping these animals.

CTR educators focus on enrichment and space:

“One of the things that we do here, here are a couple things about Carolina Tiger that’s different from the zoo. Number one, you’ll notice our enclosures. At zoos they usually have a wide open space and a little place in the back for the animal. We design enclosures for the comfort of the animals, so there are plenty of places for them to hide or play in. Secondly, every day we give them something new to play with or to examine. And it could be as simple as a box with a piece of meat in it, or a piece of cloth that’s been scented. We call that enrichment. That is so... this animal’s native habitat range would be 50 square miles. She’s got half an acre. So what we’re trying to do is keep their mental stimulation up so that they don’t become bored and develop neurotic ticks that you see in, um, zoo animals and captive animals. So we try to keep their minds engaged as well.” (CTR LAIE 25)

Note that this educator communicates that this facility is doing a good job while also reinforcing the idea that animals should be out in the wild. They also favorably compare CTR to a zoo, bolstering the legitimacy of CTR's commitment to welfare, as the contrast highlights their commitment to the animals as individuals not as specimens for a collection.

At DLC, educators also discuss enrichment activities and the quality of care, but they also always mention the Natural Habitat Enclosures (NHEs):

"If you guys take a look over on the right side of the silo, you'll notice we have a fenced in part of the forest. One of the things that makes the Duke Lemur Center so unique is that we actually have a free-ranging program for our animals. So we have about 80 acres total here, and we have that split up into 9 different natural habitat enclosures... So there are parts of the forest that are fenced, we had the tree line away from the fence so they can't leap from a tree over the top of the fence, is electric, and it's tall enough they couldn't leap over it from the ground either. So through about mid-April to mid-October, as long as it's warm enough, the free-ranging animals can go out into the forest, and they pretty much just run around there, day and night, pretty wild, and they can forage from any of the food out there, and we will take a supplementary diet to them daily, but they really just do a lot of foraging out there and just behave the way wild lemurs would." (DLC LAIE 11)

Emphasizing the NHEs serves several purposes at DLC. First, it demonstrates what many would consider the highest standard of care, one that cannot be afforded by most facilities (either due to space or resource constraints). Second, it supports research efforts at DLC, so that researchers can see lemurs behaving as close to "natural" as could be expected in a captive environment. Finally, it reinforces the superiority of wildness in general. Even though the animals are not truly wild, they are being given the next-best thing in a captive environment. DLC educators also emphasize the explicit distance they keep between the people and the lemurs, emphasizing their wildness even further:

"You'll never see people here picking them up and cuddling them. That's because, since we're technically a research institute, we're doing research. We don't want them to act like a cuddly house pet." (DLC LAIE 179)

While CTR educators also emphasize that CTR is a no-touch facility, their reasoning for this choice is that they do not want to cause the animal undue stress; while the no-touch policy is similar, the moral justification is very different, again emphasizing the value of the animal either as an individual with a right to personal space, or as a scientifically interesting taxa.

At NCA, educators highlight the quality of care by emphasizing the high quality of the food and the filtration systems:

“They’re all restaurant quality, since we’re an [AZA] facility, we’re held to really high standards. So we try to feed ’em as close to what they would eat in the wild as possible. Plus we give them vitamins too, to keep them healthy. Cause they’re not getting as much sunlight, and vitamin D and that kind of thing.” (NCA LAIE 158)

“We have to work really hard to keep our water nice and clean for our fish and our otters. So we have biological filtration, which you guys are going to see tubs like that. They look kind of dirty, but they’re not. We’re actually breeding good bacteria in there on purpose. And that eats all the bad bacteria, all the bad stuff in the water. Same thing with this protein skimmer, that’s a similar way. We also have chemical filtration; we blast it with UV light.” (NCA LAIE 162)

While NCA educators do not typically talk about mitigating the stress levels of the animals, but when they do, they are emphasizing mitigating the stress caused by guests:

“You can feel this water is warm, if you stick your hand in it it’s a lot warmer than the water in the touch tanks. They put cold water in the touch tanks, that keeps the animals a lot more relaxed; they’re getting picked up a lot, they get really warmed up when people are holding them all the time, so we don’t want them having stressed out and getting all antsy and active. So they keep that colder water in there to keep them a lot more relaxed and docile. (NCA LAIE 79)

As a thought exercise, keeping an animal cool and docile so that they could be handled by the public would never be acceptable at DLC or CTR. The way NCA treats the touch tank animals emphasizes the value of the animal as an educational ambassador above its value as an individual or a specimen of scientific concern.

8. Conservation efforts

Educators at all three sites described conservation efforts of some kind. Conservation practice can be considered one form of behavioral norm. While actors tend to operate at a scale

above the individual, citizen support for conservation is critical to its success . CTR educators frequently highlighted threats in the wild, but only occasionally followed those threats with a description of conservation effort or success:

“Unfortunately, that's why we hunted [ocelots] to extinction in this country. They used to be found in the Southwest United States, Arizona, New Mexico, southern Texas. But back in the 60s and 70s when it was fashionable to have ocelot pelt coats, we were actually exporting hundreds of thousands of those coats. And it takes 30 to 35 pelts to make one coat, so we hunted these animals to extinction in this country. The good news is scientists are now seeing some ocelots in southern Texas, and I believe in Arizona. So if they haven't reestablished themselves in this country, they're at least coming across the Mexican border, so they're trying to come back into their native range. So one thing that we can thank for that is probably the introduction of the Endangered Species Act, because I believe they were covered under that.” (CTR LAIE 200)

Because CTR does not engage directly in in-situ conservation, the information about how to protect cats in the wild is not based on personal or organizational experience. In fact, the educator is not fully confident in the use of the Endangered Species Act in the story.

DLC educators speak very specifically about DLC's efforts in Madagascar. This allows the educators to provide a high level of detail. Most notably, all educators describe DLC's reintroduction of black and white ruffed lemurs:

“But what we've done, several years back, some people from the Duke lemur Center helped set up a small park in Madagascar, and it had black and white ruffed lemurs in it. But there weren't enough black and white ruffed lemurs, so what we did is we took some of the lemurs that we had here that were used to running around in our forests and we took them down to Madagascar and let them loose. And we found that some of them have gone on to have babies with the local lemurs, and now their babies are having babies, and that's called reintroduction. So that is really important for conservation.” (DLC LAIE 19)

Beyond DLC's reintroduction effort, educators also describe DLC's general conservation work:

“And those kinds of lemurs are the ones were doing our best to try to protect and preserve in Madagascar. Cause we don't want any of these guys to disappear forever. Once they're extinct, they're never coming back. So here we work to preserve these animals by breeding them in captivity, so we have baby lemurs here at the lemur Center. And we're working in Madagascar; we're actually doing things like going into Madagascar and planting trees. If we plant trees we're growing forests, and if we grow forests? [Kids: lemurs live!] Exactly, lemurs have a place to live. And that's just one of the things we're doing to try to make sure that lemurs are going to be around for a long time into the future.” (DLC LAIE 13)

At NCA, educators discuss NCA's turtle conservation work on every tour:

"So we do a little bit of rehabilitation at our aquarium, so a lot of times we'll get calls about turtles, they'll wash up on the beach and they'll be near death, and we'll find them and bring them here. Warm them up, feed them, give them vitamins, make sure they're nice and healthy again, and then we'll release them back out into the ocean. And then we also get some hatchlings. We'll go and excavate the nest about 3 days, roughly 72 hours after the nest hatches, check to see how many eggs hatched, if there were any weaklings left behind. And if there were we'll bring them here, and we actually have this cool little basket that our aquarium designed that is used by several aquariums now, so good for us. The hatchlings will come in here, and they'll rest on this little basket, so it keeps them wet but then they can just lift their heads to get air, they don't actually have to swim." (NCA LAIE 159)

Beyond turtle conservation, a few other animals were sometimes featured, as was the case on this otter program:

"Now, trapping in North Carolina was not actually legal until 2004, that's because when we initially came over, we actually decimated the otter population with trapping, and we reintroduced the species in the late 90s, early 2000s, and they actually repopulated in very few years. And now we actually find otters in all 100 counties of North Carolina, and trapping is once again legal. You can sell the goods and everything like that, but that one there was designed to be a scarf – someone was illegally trapping them, and you can see that would actually probably make a really nice scarf, because it is ridiculously soft." (NCA LAIE 84)

Even as the educator emphasizes conservation success, the success in this story begets the ability to trap them and use them as scarves, evoking a utilitarian perspective even though the otter is one of the most charismatic species at NCA.

9. Asking for help

The type of help requested and the frequency of those requests varied widely across sites. CTR educators ask explicitly and repeatedly for help throughout the program, and then articulate a long request for help at the end of the program:

"Other ways to help are - certainly you can volunteer, we are all volunteers. You can be a member, which if you want to be a member you can do an individual membership, family membership, if you want to join today we take off the price of whatever your tickets were for today from the price of your membership. You can come for a year for free. We have sponsorship of animals, which is a smaller packet, you know 30, 50 bucks to sponsor and then you get a picture of the animal. Or we have adoptions, which is you taking on that animal for the lifetime

of that animal, it's a larger commitment, it's like \$500-\$1000 a year, but you become an animal parent, you get to see that animal whenever you would like. We have our barn raising fund which helps with enclosures, we have the dinner club, which is a way you can feed a cat for one meal, you can feed for a week, there are ways of donating for different areas if you want to help with food. But lots of ways to get involved, you know where here to give these animals a good home and to get the word out about, you know what it was that brought these animals here, So again, be our voice, bring a friend, tell a friend you were here. Like us on Facebook, our Facebook page is actually better than our actual website, there's more on it... more people go to that than to the website. And if you go to our Facebook page now there are some pictures of the new lions, Roman is the lion with the mane so we will have a lion with a mane which will be nice. Everybody's like where's the mane! But we will have one. So thank you again for coming!" (CTR LAIE 25)

CTR provides a variety of ways to get involved, ranging from small requests such as liking the Facebook page, all the way to volunteering. All education programs ended with this type of plea, and all educators offered multiple ways to get involved. These requests ascribe responsibility to the individual to help CTR help the animals.

DLC educators rarely ask directly for support during their tours. Occasionally educators mentioned that tour fees help lemurs, and going on other tours and shopping in the gift shop helps as well, but they do not directly name any other ways to get involved. Here is a typical end-of-tour speech:

"If anybody wants to come and visit, we have some specialty tours that we're gonna be offering for the summer. One is the walking with lemurs tour, that takes you out into the forest. We're also offering a painting with lemurs tour. Lemurs do like to finger paint, and we use that as enrichment here, so something fun for them to do, kind of to break up their daily routine, and so that tour you can come and pick out your paint, you can watch the lemurs actually do the painting, it's actually kind of a group effort, and then you get to see your portraits home with you, so that's a pretty fun tour also." (DLC LAIE 11)

So, while some DLC educators mentioned the importance of financial support from the public, that support comes in the form of educational program attendance and shopping in the gift shop.

At NCA, I recorded no direct instances of educators asking for help from visitors. In part, this difference reflects funding structures at each site, but even though NCA does not depend as heavily on donations, they could still advance their educational and institutional goals by

encouraging people to volunteer, join as members, or sign up for newsletters – all of these options are available at NCA, yet never mentioned during LAIEs.

10. Behavioral directives

Lastly, outside of helping the organization directly, behavioral directives are included in some of the tours, but each organization makes different requests at different frequencies.

In addition to asking for help for their own organization, CTR educators frequently ask guests to consider two other main behaviors. First, they ask guests to support legislation to ban the ownership of exotic animals:

“You guys are our public, our mouths, with the SPCA saying, you know be their voice- that's kind of what we have for us, and it's election year, what a great year to bring things like this to a congressman. If you've got nothing else to ask, you can ask about wildlife animal laws, how things are changing, you know, what is our state doing right now in North Carolina, it's one of the eight states that has no laws about wildlife as pets.” (CTR LAIE 25)

Second, they ask guests not to support entertainment, photo opportunities, circuses, etc.:

“She started out life on the beaches of Cancun as a photo op. When somebody walks up with a lion cub, and says ‘you want to hold the lion cub and I will take your picture for 20 bucks?’ Please, if you are at the state fair or county fair and you see a booth like that, don't do that, you are encouraging these people, and when that lion or tiger cub gets big enough it's probably going to be killed, because they can't make any more money off of it and unless they can sell it to someone who will put it in their back yard and give it an equally miserable life, you are just perpetuating the pain.” (CTR LAIE 544)

Both of these requests fall in line with the animal welfare component of their mission. CTR educators do not ask visitors to engage in any general conservation behaviors.

At DLC, while the educators and staff indicated during interviews that they would like visitors to take action for environmental causes they care about, they do not explicitly mention any behaviors during the LAIEs outside of supporting DLC.

NCA educators provided the most specific individual behavioral directives, asking guests to assist nesting/hatching turtles by filling in holes on beach, removing chairs and other objects, turning off house lights, etc. These turtle messages were included in almost every NCA LAIE:

“I know I used to like to dig big holes with my shovel. I’d go down and build sand castles. But when we change the shape or the profile of the beach, it makes it difficult on these mother turtles to climb up and lay their eggs. So if ever we dig holes, we should be careful to fill them back in when we’re done. Just as much fun to fill them back in as it is to dig them. The other things that we do... I hate to admit it but we’ll often take our tents and our chairs, set ‘em up and then decide to leave them overnight. And if we do that, unfortunately, it has an effect on the turtles. Now most people don’t realize that they’re just doing it to make it easy on them but if a mother turtle was to climb up out of the ocean and to run into something that we had left behind, typically what they’ll do is what we refer to as a false crawl. We’ve got pictures of this happening on our coast. The mother turtle is very picky. She gets very little opportunity to try to protect her babies....The only maternal investment she has is selecting a good nest site, and if there are beach chairs, when they come up out of the water and they run into those things, they will return back to the ocean. And after trying to find a suitable nest site two or three times, they have to abort their eggs.” (NCA LAIE 98)

“So this is a big, big problem that we have: turtles eating plastic. The Topsail Turtle Hospital sent us a statistic a few years ago that said 68% of turtles that they do necropsies on, they find some form of plastic in their stomachs. So this is really, really bad. And that’s why it’s so important that we pick up our plastic.” (NCA LAIE 209)

The quotes in this behavioral section represent the entire amount of time dealing with this topic on each tour. In other words, the time spent on behavioral recommendations during LAIEs was typically only a few sentences.

Summary

Educators at each of the three sites evoked a VBN chain that was consistent with valuing the animal as an individual (CTR), species (DLC), or ecosystem (NCA). These different types of valuations set up a VBN logic that casts the threats and the solutions as different things depending on the nature of the valued object.

However, while the ascription of responsibility also depends on the threat, the actions suggested by each organization as a means to mitigate harm are constrained by both the logical

agent and the institutional limitations. While traditionally the VBN framework ascribes responsibility to the individual, there is also support for the idea that the responsible agent can be other entities (Stern, Dietz and Black 1986).

Across all three organizations, there are three potential agents to whom responsibility could be ascribed: the government, the organization, and the individual. Only CTR educators mention governmental actors (i.e. legislation to ban exotic animal ownership), but they still ask individuals to support legislation, effectively including individuals as potential agents of change as well. Educators at CTR and NCA established direct behaviors for the individual; NCA educators recommended various beach behaviors and CTR educators encouraged visitors to abstain from patronizing the animal entertainment industry. Finally, educators also cast the organization itself as a responsible party. By framing the organization as a key player in solving problems, the educator assures the individual that helping the organization is an effective way to help reduce the threat to the valued object. The good work of the organization was established at all three facilities, but educators asked the individual to help the organization always at CTR, sometimes at DLC, and essentially never at NCA.

3.5. Discussion

3.5.1. The new VBN typology

This study contributes to the further development of the VBN theory by modifying the generalized framework of pro-environmental values, beliefs, and norms to apply to specific contexts. The cases in this analysis are all animal-themed education facilities, but this type of specified pathway could be developed for other environmental institutions as well, which could improve our collective understanding of how values, beliefs, and norms are addressed by organizations, institutions, and programs. In other words, the VBN framework is a useful tool to

consider thematic pathways of information that move from values to behaviors, possibly creating a highly compelling narrative for behavior change (Turaga et al. 2014)

While this study only includes three organizations, these specified VBN pathways can be generalized to other similar institutions. The animal as an individual has clear links to the animal rights movement (Regan 1987, Traĭni 2013), and the animal as species ties well into the well-established concept of using flagship charismatic species for conservation efforts, although this practice may have limited ecological value . Finally, the animal as a place-specific ambassador not only has a home in zoos and aquariums housing local species, but also can be seen in the rise of the place-based environmental education movement (Sobel 2006). These three institutions use these VBN narratives to reinforce both the value of the animal itself and the mission of the organization, as they each highlight the one that corresponds with their mission.

By constructing a logical VBN chain around a valued object, the argument to take action can be supported by appropriately targeted values and beliefs. This could lead to increased likelihood of action (Chawla and Cushing 2007). Thus, understanding how values-oriented pathways towards behavior change are constructed can help organizations better design educational content to achieve strategic shifts/reinforcements in learner values, beliefs, and norms. Quasi-experimental research is needed testing how the construction of a VBN pathway message could lead to improved behavioral commitment.

I find that ascription of responsibility is a key component of the VBN framework in the LAIE context. While the VBN framework is traditionally used as an individual-level model, educators present other responsible actors as those capable of change, and then appeal to the visitor to support *those actors*. The original VBN framework does include public non-activist behaviors (such as supporting other organizations), but the key difference is that the educational

content at DLC and CTR focuses on setting up the organization as the responsible agent at both places, but then the step towards asking the visitor to support the organization depends on the needs of the organization. In other words, the organization is the agent in both cases, but whether or not the organization needs the individual's help is contextually specific. At NCA, on the other hand, the organization is rarely evoked as the primary agent in conservation change. Instead, the focus on beach-specific behaviors casts the individual as the responsible agent, and the organization as the deliverer of the message (as opposed to the conservation agent). While the behaviors at NCA represent only a tiny contribution to turtle conservation, the perception of the self as the agent of change has been argued to be the most effective way to bring about behavioral change (Eden 1993). More information is needed about how the process of ascribing responsibility to the individual or to a larger entity affects whether learners feel compelled to take action.

3.5.2. Role of the organization

One contribution of this paper is to bring specialty organizations like DLC and CTR into the discussion of the responsibility of environmental education. Zoos and aquariums have been shifting towards increased emphasis on promoting conservation ethics and behavior, and an increasing number of researchers and practitioners are calling for the tightening of these types of messages in these contexts (Fraser and Wharton 2007). In my study, key informants and educators at all three institutions cited larger goals of environmental care/action, suggesting that these shifts toward greater responsibility for conservation education appear to be happening at both generalist and specialty organizations alike. Even if organizations fill different niches in animal conservation efforts, each organization plays a role in this larger societal shift towards

more frequent and consistent messages about the importance of species and ecosystem conservation as well as animal welfare.

My comparative analysis suggests that the organization is inseparable from the VBN messages at each site. Specialty organizations have unique opportunities to demonstrate care in a way that a more generalized organization would not. While the organizations might also be aiming to get individuals to care more and act more (in line with the goals of conservation psychology), the reality is that these animals are being displayed as way to get people to care *in the way that the organization cares*. It is modeling values, and while the long life of a learner can include messages of all types, the message they get in these places is not just one of reinforcing general conservation principles, it's *specifying* a particular set of principles based on the animal.

The financial needs of each organization also drive the ways in which they ask audience members for support. CTR depends on support from the public, and educators always ask for this support from guests. DLC does not rely much on small donations for their operations, but tour fees can go to conservation programs (whereas Duke and NSF funds cannot), so they sometimes mention this support but it comes up more rarely than at CTR. As a taxpayer-funded facility, NCA educators never ask for financial support from participants. This need for audience actions does not just affect what behaviors they endorse, it affects all elements of the VBN chain. In other words, the organization frames the valued object, threats, and ascription of responsibility in way that suggests the organization is a key actor in mitigating harm. In CTR's case in particular, the need for money is set up by the threat of private ownership *combined* with a lack of funds for rescue efforts. While this is not necessarily a problematic practice, the fact that the educators are selling the mission and the organization as much as they are selling environmental principles has

implications for the types of educational content that could be logically included in these types of LAIEs.

This work also highlights how the role education within an organization impacts how messages are constructed during LAIEs. CTR is working to promote a set of values, so their ultimate goal is to use education to get visitors to agree with them about animal welfare. DLC uses education to teach about conservation by promoting *the good work they do*. NCA is the least beholden to their mission in their educational work because their work *is the education*. These differing purposes for education highlight the difference between the specialty organizations and the “generalized” places like NCA: education can be seen either as a means to an end (in the case of education to facilitate conservation) or as a way to promote the center’s conservation efforts to establish conservation (or animal welfare) as a norm. The aquarium uses the former definition, whereas CTR and DLC use the latter. This distinction is important because it affects educational goal-setting and limits the ways in which education can be used as a tool for change.

Educators highlighted the quality of animal care across all three sites, a practice which serves multiple purposes. First, high quality care legitimizes the organization as a responsible agent in making sure these animals have an acceptable quality of life. Second, high quality care helps justify the keeping of animals in captivity in general, as their captive lives must mimic or even rival their wild existence in order for the practice of keeping them to be acceptable. Third, it establishes the animal as worthy of this kind of care, which contributes to the establishment of the valued object itself. This data shows that these types of organizations are responding to the general shift towards increased accountability in captive animal management, which is a positive trend towards improved animal lives in captivity (Hutchins et al. 2003).

As stated in the introductory chapter, animals are used as ambassadors for environmental messages because they get us to expand our sense of moral obligation to animals and the environment. I find that in addition to serving as ambassadors for the environment, the animals also serve as ambassadors for the organization itself. They tell the audience that this organization is doing good work, and that this work benefits animals both in and outside of this facility. This means that the ability of the animal to serve as an ambassador for environmental messaging is limited by the context in which it is held. Thus, even when the educators do connect to larger ecological concepts, the topics familiar to the organization are spoken of with more attention and specificity than those concepts with which the organization has few ties. The best example of this comes from the “not pets” messages contrasted with the in-situ conservation stories. Essentially, the salience of these two topics is reversed between CTR and DLC: CTR has concrete, personal “not pets” stories and abstract conservation information, whereas DLC has personal conservation stories and abstract “not pet” concepts. While both topics are covered at both facilities, the length of time devoted to it and the level of detail reflect the institutions’ involvement in that area. The institutional context serves as both an asset and a hindrance; organizational relevance allows the educator to imbue the topic with more personal meaning, but the organization’s ability to connect the animal to diverse messages is limited. The ability to attach messages to education animals is also limited by cultural perceptions of its need for welfare. The “not pets” message was not once considered for aquarium animals, even though they are popular pets; this omission suggests that the threats facing each animal have less to do with the frequency with which animals are taken as pets, and more to do with the cultural perception of keeping that particular type of animal.

3.5.3. Expanding moral obligation

The way educators construct the value of the animal impacts the expansion of one's moral obligation. Constructing the value of the animal as an individual, species, or ecosystem suggests that the animal should be included in one's moral circle at that scale, but my data suggest that expanding the circle at one scale may come at the expense of another circle. In particular, at NCA, the animal as a specimen in a collection leads to very little consideration of the animal as an individual with thoughts or feelings. On the other end of the spectrum, CTR's programming is designed to communicate values primarily focused on the individual animals' right to a good life. This leaves limited space to consider the needs and threats to the larger ecological systems they inhabit. At DLC, the focus on the species is analogous to the promotion of flagship species conservation, a concept that may have limited value for conservation (Andelman and Fagan 2000). While the expansion of moral care might radiates out beyond the scale it was initially established, the process of expanding one's moral circle to different types of animals is not well understood, but this represents an important future direction for this work.

One distinction worth mentioning is the difference between the idea in EE and nature interpretation of making something meaningful to someone, as opposed to promoting an egotistic values orientation. The animal as an individual, species, or ecosystem has the capacity to hold relevance to the individual, but the choice that the individual is the most important actor implies an egocentric orientation that might actually confound the ability of personal meaning making to actually expand one's moral circle. This potential tension between egocentrism and personal meaning making is not discussed in the VBN literature, but my results suggest that while educators see the importance of personal relevance to the individual, explicit language in which egotistic values are evoked are rare in LAIEs. This absence of egocentric language could mean

several things. First, it could indicate that egotistic value framings are socially undesirable in these contexts. Second, it could suggest that the evocation of egotistic values is more subtle than altruistic or biospheric values orientations. Finally, it could reflect the literatures' general conclusion that egotistic framing of environmental value is a weak (or even negative) predictor of pro-environmental behavior . In any case, the need for personal relevance is considered to be a bedrock of nature interpretation (Brochu and Merriman 2002), but the subtle ways this promotes egocentrism may be in conflict with the ultimate goal of expanding one's moral circle to include things outside the self (Schultz et al. 2004).

3.5.4. Limitations

It may not be fair to expect each organization to spend limited LAIE time making connections to larger environmental concerns and potentially more impactful pro-environmental behaviors that seem tangential to the program (such as, for example, consuming less fossil fuel). Prescribing behaviors is tricky when learners come from different background and have different options available to them (Stern, Powell and Ardoin 2010). And the reality is that individual options to assist with institutional goals depend on the goals that the institutions have set. The realistic options for individuals to assist with lemur conservation are limited, but if lemur conservation were to be used as a springboard to connect problems in Madagascar with general environmental conservation, then real opportunities for behavioral recommendations could be made.

Educators themselves appear to be setting another limitation to their programs by expressing doubt that they can impact a majority of their learners. While shifting one or two people per program towards more environmentally-minded values, beliefs, and norms might be a realistic and/or attainable goal, this concession suggests that more attention to learner outcomes

is needed at each site so that educators can design programs that could impact more learners in each program. Understanding the learner is one of the key contributions of free-choice learning research, but more information is needed about audiences in these specialty contexts so that LAIEs can be explicitly designed to meet institutional educational goals.

3.5.5. Connecting to general conservation

Connections between general environmentally responsible behavior and these animals were notably absent from the LAIEs at all three sites. While educators included some statements about the importance of the animals, ecosystems, or environment in general, none of the educators suggested engaging in general pro-environmental behaviors, such as water/energy/resource conservation (Steg and Vlek 2009). This result is congruous with educator intentions, as their goals specifically included encouraging individuals to find their own ways to get involved with general conservation activities. While leaving the behavioral suggestions open does allow for individuals to choose behaviors based on their own personal circumstances, behavioral theory suggests that in order to change a specific behavior, it must be targeted (Ajzen 1991). General pro-environmental behavioral messages could be included in these programs if educators were interested in making those connections. So it appears that the lack of general behavioral messaging is driven more by educator goals than a practical inability to make connections to a larger environmental behavioral commitment.

While educator goals may explain part of the lack of general environmental messaging, the need to establish the primary VBN pathway might be even more of a barrier to the inclusion of general environmental content. Establishing the organization itself and its ability to mitigate threats to valued objects is time-consuming, so at NCA, where they do not need to spend time establishing the organization as the agent, has the most freedom to abstract, and NCA is also

where I see the most explicit focus on individual environmental behaviors, even if they are specific to the beach.

3.5.6. Implications for conservation

Increasingly, EE programs are being evaluated not just for the quality of the education programs, but for their ability to lead to conservation outcomes (Heimlich 2009). When compared to a list of high-impact behaviors (Brower and Leon 1999), none of the behavioral recommendations at my three field sites make the list. While supporting these three organizations might make a statement in the public sphere in support of general environmental conservation, if only the behavioral recommendations on tour were followed (and nothing more) the impact on the environment would be minimal. This reality evokes a substantive critique of EE as weak sustainability; inspiring appreciation and awareness are notable and historic goal in the EE literature, but EE has also endured criticism that it has not done enough to compel individuals to make real changes to reduce their environmental impact (Saylan and Blumstein 2011). Ensuring that every educational program calls for audiences to make big changes to reduce their impact on the environment would be unrealistic, but an institutional goal-setting process in which measurable environmental impacts are considered would go a long way to ensuring that educational content was more inclusive of environmentally significant behaviors as opposed to animal- or organization-specific behaviors. Behaviors that have the most impact include reducing car use, meat consumption, and household energy use , and by evoking the belief that everything is connected and that ecological limits to growth exist here and abroad (both elements of the New Ecological Paradigm), one could make the connection between lemurs, tigers, and the learner's responsibility to engage in pro-environmental behavior. Targeting the concept of action competency will help strengthen the chain from valuing the object to taking actions on its behalf

(Breiting and Mogensen 1999). I argue that if these educators and institutions are interested in inspiring individuals to take action on behalf of the environment, that they would benefit from a more intentional goal-setting process in which they explore ways to incorporate specific pro-environmental behavioral messages into LAIEs so that they can improve the likelihood that learners will develop the action competence necessary to make behavioral changes.

3.6. Conclusion

My analysis suggests that the VBN theory serves as a useful framework to examine how educators establish thematic pathways from deeply held values to behavioral recommendations. Establishing a thematic pathway of information from the value of the animal, the threats it faces, and the ways in which an individual can help, mirrors best practices in nature interpretation and evokes values systems that can ideally compel visitors to take action on behalf of the animal. In the specified pathway, establishing the animal as an individual, species, or ecosystem has implications for what behavioral norms are suggested, as individuals have different opportunities to help at different scales. Thus, education programs would benefit from spending more time considering what types of pro-environmental behaviors they would like to encourage, and then consider framing the animal at a scale that best leads into the targeted actions.

I also find that the organizational context, goals, and needs affect what types of VBN pathways are established. In particular, the actions suggested at each of my sites prioritize the needs of the organizations and their specific types of animals as opposed to high-impact pro-environmental behaviors, and educators at all three sites have opportunities to link the animals to high-impact behaviors that they are currently not utilizing. If LAIEs could establish norms to get learners to engage in high-impact behaviors this would also help wild animals, including their respective species of interest.

In this chapter, qualitative data was used to develop the specialized VBN pathways outlined in this chapter. Next steps with this data include a quantitative content analysis measuring at how time is divided across different types of messages. This analysis will shed more light on content variation across sites as well as the distribution of attention paid to the different sections of each VBN pathway.

The detailed demonstration of good care at each facility suggests that the growing public aversion to keeping animals in captive environments has required all of the institutions to consider the specific justification for the right to engage in this practice (Marino et al. 2010). This trend also coincides with the increased accountability in EE to demonstrate real contributions to environmental sustainability. My research contributes to both conversations by asking how animal-themed education programs tap into larger environmental values, beliefs, and behavioral norms in order to bring about change.

CHAPTER 4: THE LEARNER

4.1. Chapter overview

Environmental education and nature interpretation have the capacity to produce shifts in values, beliefs, and norms in order to promote pro-environmental behavior (Adamowicz et al. 1998, Ramsey and Hungerford 2002, Turaga et al. 2010). However, learners do not arrive at interpretive programs as blank slates (Falk et al. 2009). Instead, learners enter with rich, varied previous experiences that influence the way they engage with and interpret education programs (Schultz and Tabanico 2007). Thus, understanding the visitor is crucial to understanding education program outcomes, which in turn helps educators better design programs to meet learning goals (Clayton, Fraser and Saunders 2009).

Previous studies examine free choice learning audiences either at one institution or one type of institution (Khalil and Ardoin 2011), but there are few studies comparing across organizations (Dierking et al. 2002), and even fewer comparing across types of organizations (Ballantyne, Packer and Hughes 2008). No previous research has addressed the question of whether animal-themed facilities with different missions draw fundamentally different audiences. Understanding the impacts of LAIEs in different settings is impossible without examining differences between audiences in terms of their incoming characteristics. This chapter explores the incoming characteristics of the learner, responding to the questions: What experiences, values, beliefs, and behavioral norms do participants bring to the LAIE, and how do learners differ across sites? I use value-belief-norm (VBN) theory and significant life experiences (SLE) as driving frameworks to help understand how visitors differ across each site. Using my learner surveys and interview

data, I build a profile of the learners at all three sites and consider how their experiences relate to those outlined in previous SLE work on environmental activists.

4.2. Survey results

The pre-program survey measured the incoming characteristics of the individual, including party information, demographics, and VBN variables. I collected 461 pre-program surveys, including 158 at CTR, 151 at DLC, and 152 at NCA.

4.2.1. Party characteristics

NCA visitors arrived in the largest parties, with an average party size of 4.8 (vs. 4.4 at CTR and 3.9 at DLC; Table 4.1). However, 77% of the parties across all three sites had 2-5 members, suggesting that the larger party sizes drive the different means across sites. Approximately 66% of the parties at NCA included children, 61% of the parties at CTR included children, whereas only 41% of the parties at DLC included children. NCA had the highest proportion of parties with children despite being the only facility that has age restrictions for the general behind the scenes tour (children under 5 are not allowed).

4.2.2. Previous experiences

On average, people had visited NCA 4.5 times before the program before which they took the survey, which is significantly more previous visits than CTR, where respondents had visited an average of .47 times previously, and more than DLC, where respondents had visited .19 times previously. To put this differently, 77.6% of CTR survey respondents were on their first visit, 85.7% of DLC visitors were on their first visit, whereas only 31% of NCA visitors were visiting for the first time.

I measured previous experiences by asking participants if they had visited any of the following facilities in the last two years: zoo, aquarium, nature center, state or national park,

natural history museum, circus, science center, botanical garden, animal rescue, or other.

Participants at DLC have visited significantly more of those locations (4.7) than participants at NCA (4.0).

Table 4.1. Characteristics of the populations across the three field sites. ANOVA analysis (Bonferroni posttest) used to determine predictive capacity of the site variable.

	CTR (1)	DLC (2)	NCA (3)	ANOVA (significant pairs in parentheses)
Party characteristics				
<i>% parties with children</i>	60.5%	40.7%	66.4%	F(2, 445)=11.24, p<.001 (2 vs. 1 and 2 vs. 3)
<i>Mean size of party</i>	4.4	3.9	4.8	F(2, 444)=4.37, p=.013
Previous experiences				
<i>Mean # visits before today</i>	.47	.20	4.46	F(2,445)=83.56, p<.001 (3 vs. 1 and 3 vs. 2)
<i>Mean # types places visited in last 2 years (max 9)</i>	4.3	4.7	4.0	F(2,443)=2.95, p=.05 (2 vs. 3)
Demographics				
<i>% residing in NC</i>	84%	73.3%	50%	F(2, 438)=22.37, p<.001 (2 vs. 3)
<i>% female</i>	57.2%	56.4%	65.8%	F(2, 444)=1.65, p=.19
<i>Mean age</i>	45.0	44.8	44.9	F(2, 432)=0.0, p=.99
<i>% with graduate degree</i>	41.4%	43.9%	27.6%	F(2,442)=6.58, p<.001 (2 vs.3)
<i>% nonwhite</i>	7.3%	8.9%	3.5%	F(2, 436)=1.36, p=.26
<i>% work or volunteer in environmental sector</i>	16.1%	22.2%	23.2%	F(2, 432)=1.34, p=.26
<i>% visitors with household income above \$100,000</i>	43.9%	44.4%	48.5%	F(2, 394)=.14, p=.87

4.2.3. Participant demographics

Participants at the three sites were statistically indistinguishable on gender distribution, age, race, environmental work/volunteering, and income. Participants were also older, more wealthy, more educated, and more female than the general population: females comprised 60% of the respondents, 45.6% of respondents live in a household with an average income of above \$100,000, 38% have a graduate degree, and the average age was 44.9. The population across sites was also over 90% white at all three sites.

Participants differed slightly on educational attainment across sites: more people with less than a college degree and fewer with a graduate degree attended programs at NCA than CTR and DLC ($\chi^2(6, N = 45) = 23.0334, p < .001$). More non-NC residents attended programs at NCA than CTR or DLC. Fewer Democrats attended programs at NCA than at CTR or DLC (Figure 4.1), and more Republicans attended programs at NCA than CTR ($t(277) = -8.04, p < .01$) or DLC ($t(286) = -7.60, p < .01$). However, while more Republicans visited NCA than any of the other sites, in 2012, Carteret County (NCA's home county) voted 70% Mitt Romney/29% Obama (Politico 2012). So even though NCA attracted more Republicans than CTR or DLC, the sample appears to also be more Democrat-leaning than the local population. CTR also seems to be drawing a population that is more liberal than its home county: Chatham County went 52% Obama/47% Romney (Politico 2012). DLC's learner population more closely mirrors the political leanings of Durham County (76% Obama/23% Romney). While the 2012 election is a crude metric with which to compare populations, it still highlights the fact that even though NCA's visitors are relatively conservative compared to my other sites, they still attract a majority Democrat population in an area that is overwhelmingly conservative. This Democrat majority cannot be attributed to NCA's out-of-state visitors, as I found no statistical relationship between political affiliation and whether the learner lives in-state ($F(2, 423) = .1, p = .91$).

4.2.4. Attendance motivations

Participant motivations differed across sites ($\chi^2(16, N = 418) = 38.1839, P < 0.001$). CTR and DLC learners were more likely to select "I'm curious about this place" than NCA learners, who were more likely to indicate that they had an interest in the species/topics covered in the program (Figure 4.2).

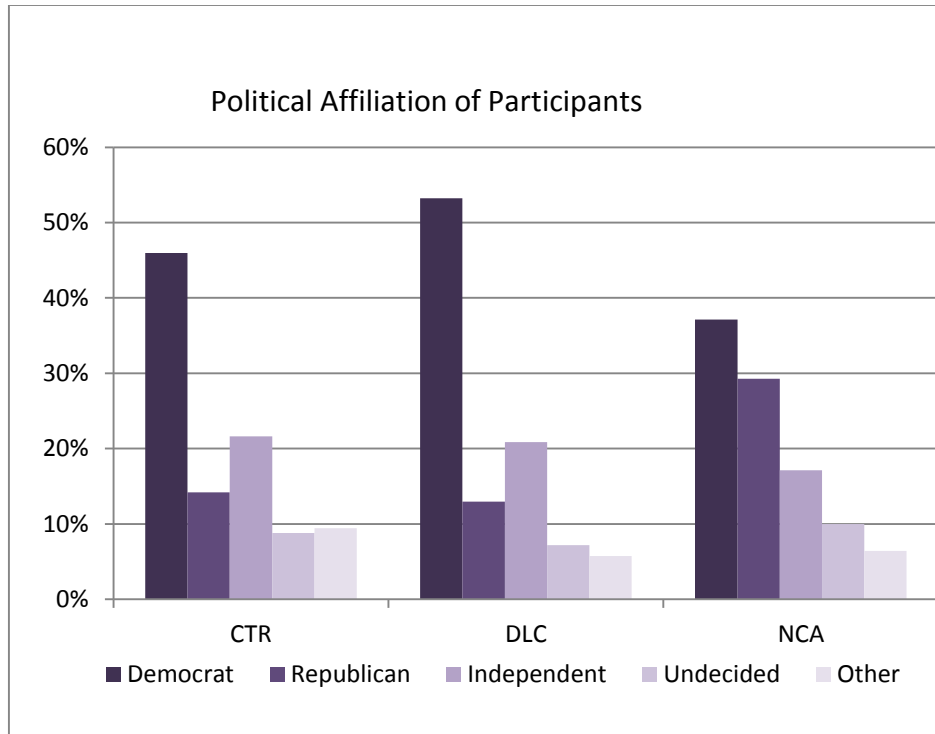


Figure 4.1. Political affiliation of participants by site. Fewer Democrats and more Republicans attended programs at NCA than at CTR or DLC.

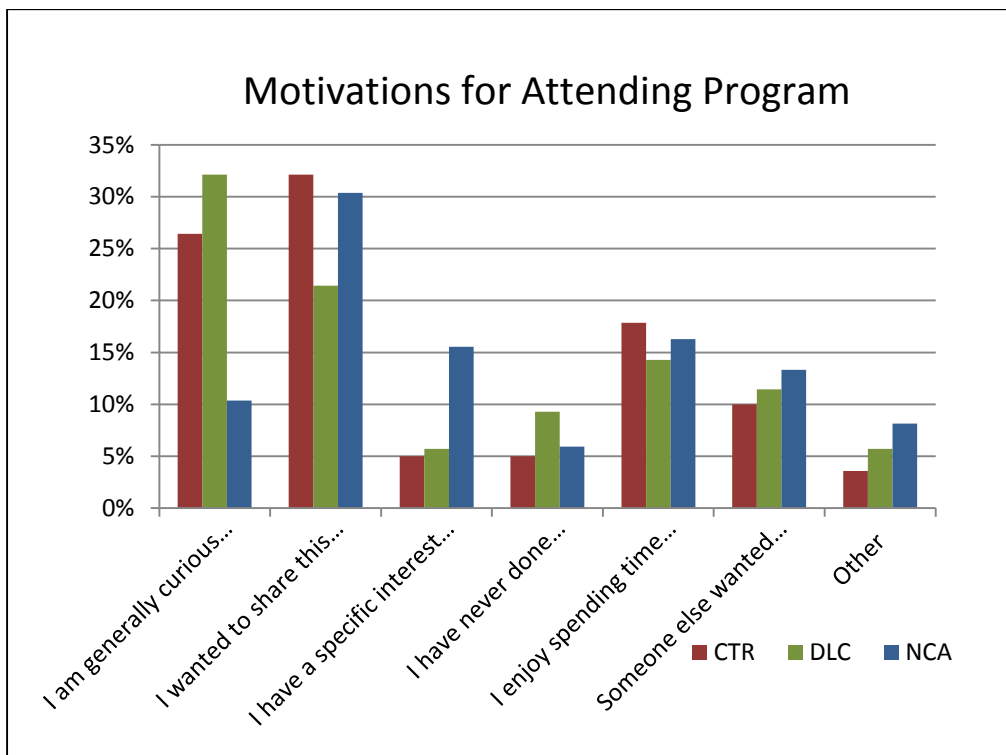


Figure 4.2. Participant motivation for attending LAIEs across three sites.

In sum, participants differed across sites in terms of demographics, previous experiences, and motivations for attending the LAIE.

4.2.5. VBN results

All of the VBN variables are comprised of the mean scores of multiple Likert-scale questions (Table 4.2). The AAS and the NEP use a 1 to 5 scale, the norm activation questions use a 1 to 4 scale, and the values questions use a -1 to 7 scale, with -1 labeled as “opposed to my values, and 0 to 7 labeled from “not important” to “extremely important” (Appendix E). All of the analyses using the VBN variables use the mean score for each metric. Alpha scores above .7 suggest acceptable internal consistency (Nunnally 1978), so most of the VBN variables are reliable constructs, with egotistic values only barely missing the cutoff (Table 4.3).

Table 4.2. Descriptive statistics for VBN variables.

	AAS	NEP	Severity of global env. Problems	Severity of local env. Problems	Personal sense of responsibility	Egotistic values	Altruistic values	Biospheric values
# questions	20	15	6	6	2	5	4	4
scale	1-5	1-5	1-4	1-4	1-4	-1-7	-1-7	-1-7
CTR								
min	1.95	2.13	1.33	1	1	-0.8	2.25	1
mean	3.54	3.79	3.47	2.71	2.62	2.97	4.13	4.98
max	5	4.87	4	4	4	5.6	5	7
sd	0.7	0.52	0.55	0.68	0.78	1.1	0.57	1.44
DLC								
min	1.95	1.93	1.33	1	1	-0.4	2.5	0.75
mean	3.46	3.87	3.53	2.76	2.61	2.94	4.25	5.15
max	5	4.93	4	4	4	6	5	7
sd	0.63	0.58	0.52	0.7	0.78	1.15	0.54	1.34
NCA								
min	1.5	1.53	1	1	1	-1	2.75	-1
mean	3.35	3.69	3.36	2.78	2.76	3.13	4.3	5.06
max	5	4.93	4	4	4	6.2	5	7
sd	0.64	0.61	0.66	0.75	0.75	1.35	0.55	1.48

Table 4.3. Cronbach's alpha scores for VBN variables

Variable	Alpha score
Animal Attitudes Scale	.86
New Ecological Paradigm	.81
Egotistic values	.67
Altruistic values	.82
Biospheric values	.91

The AAS, NEP, and perceptions of local and global environmental problems were all highly correlated. Personal sense of responsibility for environmental problems was correlated with perceptions of global (.32) and local problems (.39), although these constructs were worded similarly on the survey so this could be explained by common rater effects. Biospheric values correlated with all of the other VBN variables at a rate of more than .3. Egotistic and altruistic values, on the other hand, show very little correlation with the other VBN variables – the only correlation above .2 is between altruistic values and AAS, although the sign is negative, indicating that as altruistic values decline, AAS scores increase.

Table 4.4. Correlations between VBN variables (only variables with a correlation of >.3 displayed). Correlations between .3 and .5 highlighted in light green, .5+ in dark green.

	AAS	NEP	Global problems	Local problems	Personal responsibility	Egotistic values	Biospheric values	Altruistic values
AAS	1							
NEP	0.55	1						
Global problems	0.53	0.62	1					
Local problems	0.46	0.46	0.59	1				
Personal responsibility	0.24	0.22	0.32	0.39	1			
Egotistic values	-0.16	-0.13	-0.08	-0.03	0.05	1		
Biospheric values	0.37	0.42	0.36	0.45	0.32	0.09	1	
Altruistic values	-0.24	-0.08	-0.09	-0.06	0.00	0.05	0.04	1

I ran linear regression models controlling for a variety of demographic variables (gender, age, race, political orientation, income, and contact information) Both CTR and DLC visitors scored higher on the AAS than NCA visitors, NCA visitors perceived global environmental problems more severe than DLC visitors, NCA visitors feel a greater sense of personal responsibility for environmental problems than DLC visitors, and finally, NCA visitors had higher altruistic values scores than CTR visitors. I report unstandardized beta coefficients, meaning that the coefficient is relative to the scale. For example, for the AAS scores, CTR respondents had a .2 higher average score on the AAS than NCA respondents.

Gender explained a significant amount of variance for AAS, NEP, global problems, local problem, and biospheric values; in all cases, females displayed higher values. Older individuals had a higher sense of personal responsibility and biospheric scales, and lower egotistic values. Political orientation also explained a significant amount of variance for all of the VBN variables: Republicans had lower scores than Democrats for AAS, NEP, global problems, local problems, personal responsibility, and biospheric values, and had higher egotistic and altruistic scores. Nonwhite participants had higher egotistic values scores and lower altruistic values scores than white respondents.

Individuals who work or volunteer for environmental organizations had higher NEP scores and biospheric values scores. Finally, the wealthiest respondents in the survey (those with an annual household income of above \$150,000) had lower scores on the AAS, NEP, global environmental problems scale, and local environmental problems scale.

I also tested whether providing one's contact information at the beginning of the survey had any explanatory power for VBN metrics, and I found that filling out contact information

explained a significant amount of the variance for biospheric values, personal responsibility, and perceptions of the severity of both local and global problems; individuals who filled out contact information had higher scores for all four. I tested for multicollinearity among independent variables and they all had variance inflation factors (VIF) smaller than 2.5, suggesting sufficient independence for analysis (Allison 2012).

4.3. Interview results

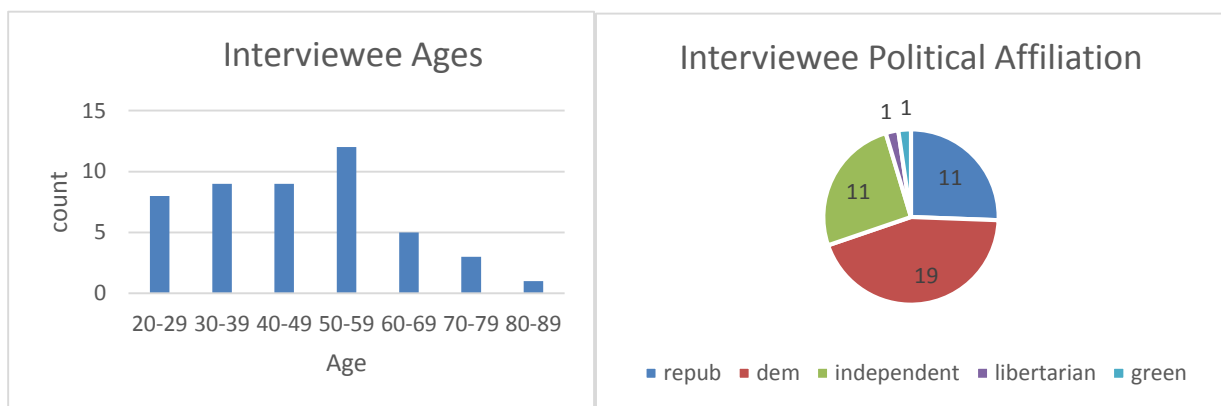
Traditional interviews allowed participants to think extemporaneously, and allowed me to ask direct questions about values and beliefs; this led to some lengthy and interesting conversations about the exact topic of interest. On the other hand, the card sorting activity (in which participants organized cards with environmental or animal themed activities on them) provided a consistent, cohesive structure for the conversation about life experiences, and they helped participants recall important stories that they may not have remembered or shared without the prompt. However, the cards limited participant experience to those listed on the cards. While I offered blank cards for participants to write in their own ideas, no one took the opportunity to use them. The process of sorting the cards also took more time than asking about life history directly, so I had to forgo other parts of the interviews in order to accommodate the card activity. Perhaps the biggest advantage of the cards is that they encouraged interviewees to think more structurally about influential experiences, which segued nicely into values and beliefs discussion in relation to the tour. Together, the two types of interviews paint a more thorough picture of interviewees than either would have alone. Because of the universal framing of the questions, I was not able to detect differences between learners across sites, so I rely on the quantitative data to make site-based comparisons.

Table 4.5. Multiple linear regression models for all VBN metrics. The first line for each independent variable displays the beta coefficient and the second line displays the standard error.

	Dependent variables:							
	AAS	NEP	Severity of local env. problems	Severity of global env. problems	Personal responsibility	Egotistic values	Altruistic values	Biospheric values
Independent Variables:								
CTR (NCA ref)	0.200** [0.07]	0.052 [0.07]	-0.141 [0.09]	0.055 [0.07]	-0.138 [0.10]	-0.204 [0.15]	-0.148* [0.07]	-0.131 [0.16]
DLC (NCA ref)	0.161* [0.07]	0.094 [0.07]	-0.139 [0.09]	0.073 [0.07]	-0.249* [0.10]	-0.262 [0.15]	-0.074 [0.07]	-0.070 [0.16]
Women vs. men	0.399** [0.06]	0.137* [0.06]	0.143* [0.07]	0.168** [0.06]	0.139 [0.08]	-0.200 [0.12]	-0.067 [0.06]	0.356** [0.13]
Age	0.001 [0.00]	0.001 [0.00]	0.003 [0.00]	0.002 [0.00]	0.006* [0.00]	-0.012** [0.00]	0.002 [0.00]	0.021** [0.00]
Republican vs. Democrat	-0.382** [0.08]	-0.414** [0.08]	-0.382** [0.10]	-0.339** [0.08]	-0.271* [0.11]	0.381* [0.17]	0.175* [0.08]	-0.710** [0.18]
Included contact info	0.146 [0.08]	0.121 [0.07]	0.251** [0.09]	0.233** [0.07]	0.198* [0.10]	0.148 [0.15]	-0.039 [0.07]	0.538** [0.17]
\$150,000+ (100,000-149,000 ref)	-0.234** [0.09]	-0.169* [0.08]	-0.268** [0.10]	-0.174* [0.08]	-0.126 [0.11]	0.31 [0.17]	0.017 [0.08]	-0.342 [0.19]
Race (nonwhite ref)	-0.019 [0.11]	0.077 [0.11]	-0.107 [0.13]	-0.091 [0.11]	-0.268 [0.15]	-0.686** [0.22]	0.327** [0.11]	-0.282 [0.24]
Work/volunteer w/env.	0.056 [0.08]	0.162* [0.07]	0.076 [0.09]	0.107 [0.07]	0.187 [0.10]	-0.178 [0.15]	-0.022 [0.07]	0.464** [0.16]
Observations	370	369	371	371	370	367	370	367
R-squared	0.203	0.124	0.123	0.136	0.094	0.104	0.085	0.184
**=p<.01								
*=p<.05								

4.3.1. General profile of interviewees

For Round 1 interviews, I recruited an interview sample that was diverse in age, gender, and race, which were the only variables I could assess without the survey. Average age of Round 1 participants was 47, and they were 55% women. For Round 2, I used survey data to do a limited amount of sampling. I focused on gender, age, race, political affiliation, income, and whether or not the person had children. While I could not get a perfect random sample, I wanted to hear from diverse perspectives. Average age of Round 2 participants was also 47 (Figure 4.3a), and interviewees were fairly representative of the wider survey population on the other metrics (income and political distribution was similar [Figure 4.3b], overall sample was 64% women). The one major issue I had in both Round 1 and Round 2 was recruiting nonwhite interviewees. While I contacted every available nonwhite respondent during my recruiting phase, I was only able to get one minority interviewee.



Figures 4.3a. and 4.3b. Age and political affiliation of interviewees.

4.3.2. Significant life experiences

During the first round of data collection, I asked interviewees to discuss significant life experiences in a semi-structured interview format. When I extracted these quotes to develop them into Round 2 sorting cards, I found that almost every answer I was given had been already

discussed in the SLE literature. For example, interviewees mentioned time in the woods (alone or with friends), hiking and camping, growing up on a farm, or having pets as big influences on their lives, all of which are prominent themes in the SLE literature (Chawla 1998b).

Because interviewees sorted cards in different ways and the activity was quite fluid, I cannot quantify the ways in which cards were selected. Some participants made categories based on personal meaning, whereas others made categories of experiences (things that they had done/not done, etc. – Table 4.6). Some interviewees found the cards easier to use than others, but on the whole the card activity allowed for rich conversations and provided a concrete entrée into more abstract concepts.

Table 4.6. Card sorting strategies from Round 2 interviews.

Type of sorting	Ways in which cards were sorted
All cards have meaning	Thematic groups (nature, learning, animal encounters), positive/negative influence, high/med/low influence (x3), done more/done less, childhood/adult experiences
Some cards have meaning	Interest/no interest, stuff done/not done (x4), does apply/does not apply (x4), experienced a lot/some/none (x2), haven't done/positive impact/negative impact, would/would not do

While each individual sorted the cards in a unique pattern, some patterns emerged in the way the cards were clustered. For example, one interviewee's experience as a Boy Scout was characterized by time spent in the woods, summer camp, hiking/camping, etc. Based on the interviewee sorting decisions, I present them as popular clusters (Table 4.7). These clusters are not exhaustive or definitive, but they provide a generic view of how participants constructed relationships between the cards.

In my sample, regardless of one's current environmental activities and activist levels, interviewees cited similar experiences to research subjects in previous SLE work, with the most notable common theme being time spent outdoors (Chawla 1999). Out of the 24 interviews using

Table 4.7. Clusters of cards by thematic content.

Cluster	Cards in cluster
Outdoors experiences	Spending time in the woods, observing animals in the wild, hiking and/or camping, participating in boy/girl scouts, attending summer camp, hunting and/or fishing
Environmental learning	Reading a book about environmental issues, learning about the environment in school, learning about the environment from a loved one/mentor, watching nature programs on TV
Animal programs	Visiting zoos, aquariums, other animal-centric facilities; attending programs as zoos, aquarium, nature centers, etc. (featuring animals); going on experiential nature tour (i.e. dolphin watch, guided hike)
Animal Welfare	Experiencing difficulty with eating meat, rescuing animals (wild or domestic), participating in OR witnessing other torture animals (including bugs), seeing animals at the circus or in other entertainment shows, feeding wild animals
Environmentalism	Recycling, witnessing environmental abuse, pollution, etc., attending environmental events, demonstrations (like earth day), volunteering with environmental organizations, watching a beloved natural place get developed or degraded, working in an environmental profession
Domestic activities	Spending time on a farm, growing up with pets (domestic, exotic)
Wildcards	Travelling, experiencing unpleasant encounters with animals

the card-sorting activity, only one interviewee had little exposure to the environment as a child.

Otherwise, everyone else spoke of spent time in the woods, on farms, visiting zoos, etc. Table 4.8 provides descriptive quotes in order to provide a picture of how interviewees discussed their experiences. Some of the quotes only recount events, but others also include the impact of the event on the individual. I selected quotes for this table based aiming for diversity across sites and for quotes that succinctly captured the essence of the activity described on the card.

Table 4.8. Examples of interviewee quotes based on the experiences listed on each card.

Concept	Round 1 examples	Round 2 examples
Spending time in the woods	<i>I spent a lot of time outside. We actually didn't have a TV till I was seven, and I had two older brothers that were very, you know, active and outdoorsy, so we were outside for hours and hours, tromping around in the woods and things - I think unfortunately nowadays that's not considered safe anymore! [laughs] [DLC 43]</i>	<i>Spending time in the wild - I love it. I've had a real struggle with spirituality, but I truly feel it when I'm in the woods. It just speaks to me. Plants in general speak to me. [CTR 553]</i>
Spending time on a farm	<i>I grew up on a farm and ranch. And animals were important to our income, our livelihood. And we took very good care of our animals and everything. But they were always animals, and if it was not financially feasible to have an animal that was sick and we couldn't afford the vet bill - if they were suffering we killed them. But we tried to take care of them because if we lost animals that hurt us financially. [DLC 39]</i>	<i>My dad who was a small dairy farmer, he was in tune with the environment and did everything he could to protect and preserve it. So we've all, there's eight of us in the family; we've all kind of gotten that from growing up on a farm. [DLC 194]</i>
Watching a beloved natural place get developed/degraded	<i>I grew up in New Jersey, grew up in a farm town. And until I moved down here six years ago, that town went from a farm town [to one] that no longer has any farms. And when I was a kid there was plenty of areas to go hunt rabbit or pheasant or deer, that's nonexistent now. Deer, rabbits, sort of survive with some fields but you don't have turkeys or pheasants, the way it was prior to that... I used to fish quite a bit, in some of the ponds in the area, and that's pretty much nonexistent. [CTR 69]</i>	<i>Where I grew up, in California, in Laguna Niguel specifically, they destroyed the beach that we served on, it was really a local beach, by putting a Ritz-Carlton on it, so I've always said no, I'm not ever going to be a client of that particular [hotel] - at proms and stuff, people would go eat there and I'm like no! I won't do it! [NCA 520]</i>
Hiking and/or Camping	<i>I had never been camping over at Jordan Lake before, we took a big bike ride out there, we were on the road for 45 miles before we got to the campsite, and I was like, oh, I remember what camping was like. Like when you really feel like you're roughing it and getting out there, it means that you park your stuff in a gravel little driveway and then camp, and I don't think I've done that since I was like four or five and it was really fun. [CTR 68(2)]</i>	<i>And then ongoing, the more I am in nature and doing that type of thing, when I was in Seattle I would go on just a lot of hikes on my own and spend my time out, out in the Cascades, get to the top of a mountain, just sit there and read, sitting in the woods and read. I don't know but I prefer being there. Like I would do two or three hikes in a weekend if I could. [CTR 556]</i>

Hunting and/or fishing	I grew up in a small town in Ohio, right on the Ohio River, and I can't remember a day, and that's summer and winter that we weren't out. And it was a small town, with the river on one side and hills on the other, and we were up on the hills, or down along the river every day. Just the way you grew up, you know. Learned to hunt by the time I was eight or nine... I don't anymore; I gave up on that a long time ago, but yeah. [CTR 41]	My dad, he hunts, I grew up with him hunting and fishing and, I really don't have a problem with hunting within legal bounds, if you eat... I know a lot of people have a problem with hunting, and I just don't. Especially with the overpopulation of deer and things. So I just feel like if you're gonna eat it, if you do it responsibly. And if you're gonna kill it, and you're gonna eat it, um, and you do it within the law, it's not endangered. Um you know, that it's, that it's okay. [NCA 184]
Learning about the environment in school	I took a class a really long time ago about, I think it was called "what's left of wild." And the whole class was this really depressing theory that, you know, that even national parks are not wild. Because as soon as you fence something in or you put parameters around something, it's not natural anymore. This is not how it's supposed to be. Or it's not how it was originally. [CTR 68(1)]	First of all I did learn about the environment in school, and I had some really passionate educators who helped us do some special environmental programming in school. So this was beyond the normal school curriculum, 'cause in South Carolina the normal school curriculum is not, um... Yeah. Science is not there and environmental science is definitely not there. And conservation was definitely not there... [NCA 155]
Visiting zoos, aquariums, other animal-centric facilities	Um, with animals it's pretty much for me just... I mean going to zoos and stuff, aquariums all growing up. [CTR 116(1)]	We tried to get out and do as many learning experience kind of things, and there we had the Shedd Aquarium, and the Lincoln Park zoo is a free zoo, so we loved to go there, cause it was free and we got to see the animals. But it was also smaller, and so it would kind of be a little bit sad sometimes to see a big cat in a small space. And then the Brookfield zoo we got to go to a couple times. [DLC 141]
Attending programs at zoos, aquariums, nature centers	I'm really good about taking tours, I like them, I believe that if you got the expertise, share it with me. [DLC 53]	Attending programs at the zoo, aquariums – so [my daughter] and I do this on our own now, like the otters, but it's because we've enjoyed so much, like the field trips at school, there's always a science field trip and it tends to be around things like with the [local museum] being in our backyard... [CTR 541]
Participating in or witnessing others torture animals	I remember when I was a kid, some kids would, get a, like a bug or something, and they pull its legs off, just to be mean, and I was like, that's uncalled for, you don't do that just to be mean to an animal, you know, that's just horrible. You treat 'em, as you know, they're living... creatures, and there's just no need for that. [DLC 49]	At the time I was a kid, you know, a bunch of friends and, I don't know, boys in the '80s, you just kind of, "Hey, let's take this frog and do something weird to it and see what happens." I probably maybe did that once, during the early years, once or twice maybe. And I remember it always bothering me. And then I stopped doing it and I remembered a friend of mine shooting a bird with a BB gun, and they all took off and it was injured. It was still alive, and so it couldn't... I started crying. [NCA 520]

Growing up with pets (domesticated, exotic, etc.)	<i>We had a dog. Until we moved here, our last dog died just before we moved here and we didn't replace him. I had a lab running around with me for 25 years. Or a group of labs. [CTR 41]</i>	<i>I certainly have had a way around animals, ever since I was young. I was sort of like the pet whisperer [laughs]... I've always had cats growing up, so I cared for them. When they got hurt, they would run to my room when I was a kid, and they would you know hide under my desk cause that's where they felt the most safe. [CTR 541]</i>
Rescuing animals (wild or domestic)	<i>I don't know - I've just always loved helping animals out. I've rescued a couple squirrels that I've seen, I've rescued turtles off the road, I've just, I don't know- I can't help it! [DLC 67]</i>	<i>My dad when I was little, if we were driving somewhere – and we lived in Florida where there are a lot of dirt roads, lot of snakes of all kinds. If we were driving along and my dad saw a snake on the road, we'd stopped to park, and say I don't care what it was: rattlesnake, whatever okay? He picked it up and moved away. [NCA 518]</i>
Participating in boy/girl scouts (or other similar group)	<i>I always like observing animals and I think Boy Scouts actually played a big role in that too ... so yeah, with Boy Scouts, we did a lot of campouts and things like that, hikes, and bike rides... But with my family as well, my parents always took us camping in California, there's like a plethora of parks to go to. [DLC 37]</i>	<i>This whole group, if we can do subsets- this whole group [of cards] is about a lifelong love for the Girl Scouts because it was one of those things where I got it really young, I was like eight years old, and I got involved in the outdoors programs, back to nature, quiet time, appreciating of independence, all of the multiple facets of why I just really got into being outdoors, and being independent and being with the trees and the water and everything, and so the Girl Scouts exposed me to that. [CTR 551]</i>
Attending environmental events, demonstrations (like earth day)	<i>I vividly remember going to Earth Day in Washington DC. And being handed a plant, a tree. And when we got married, instead of doing party favors, that's what we did for our guests- we gave them a treat to start, and we've got like 12 of them in our backyard still, from [that]. Keeping you know, the environment going, nice and strong so... I like that kind of stuff. Resonates with me. [DLC 53]</i>	<i>I actually remember the first Earth Day! I'm that old... I was in high school, and it was during the Vietnam War, and we were all in that radical teenage angst, disobey your parents movement, and they played on that, getting people motivated as a movement activity, so you know I was excited about it, I had a little green E on my band instrument case that I stuck on there when they were passing them out of the cafeteria, recruiting the teenagers to go demonstrate! So I remember thinking, well that's a pretty good idea, you know? There was a lot of stuff in the news at the time about burning rivers, and smog that that is having people's eyes run in LA, and back in the day environmental poison was horrible in the 60s and 70s, and so I was of the age where we were impressionable enough and we were protesting everything else anyway, that it was something that caught my attention. [CTR 551]</i>

Travelling	<i>I traveled to Canada for five years, every week for five years, and in Canada they're very respectful of the environment. And I just stopped traveling to Canada two years ago but during that five years of traveling there, that was like another eye-opening experience, that they were so respectful of it, and everything was, well what about the environment? They were very conscious of it, and they challenge me on that kind of stuff so... [DLC 53]</i>	<i>Growing up my dad was in the Army, so we lived all over- so I got exposed to a variety of a couple different states, and we got to go to Germany, so that was cool. I guess I grew up with kind of a worldview anyway, I knew there wasn't just my little town with my little this and my little that, like, you kind of had a sense of there's a bigger world out there already. I lived in a variety of places, some were rural, some were not rural... and I had friends that were all different kinds of people in all different kinds of places and so it was kind of interesting to get exposed to that kind of variety. [DLC 141]</i>
Going on an experiential nature tour (i.e. dolphin watch, guided hike)	<i>We went on the dolphin watch a couple years back, against some of the kids had never gotten that close to a dolphin, including ourselves- it just you know, it opens your eyes of what's out there beyond just your daily life, you know? [CTR 71]</i>	<i>I spent a semester studying abroad in Costa Rica. And I learned, and you know, it was all hiking in the rain forest. I learned a lot about um ecotourism and I got excited. I guess I've done that, but you know, it was something I was kind of interested in for a little while but then I don't think it stuck with me long term. [DLC 531]</i>
Experiencing difficulty with eating meat	<i>I spent my summers on a farm with my godparents in the Midwest. And when I was there, and this was because I only spent 3 months out of the year out there, I refused to eat any meat, of any form, because I didn't know if that meat they pulled out of the freezer was one of those little animals that I played with out on the farm, so it scared me to death, to know if I was eating one of those little critters that I played with. So I refused to eat any meat the whole time I was there. [NCA 114]</i>	<i>I mean I used to eat meat but not tons of it, but I was a picky eater. And we always had a lot of vegetables around cause my mom bought a lot of vegetables, and my grandma would. But at some point in high school I just slowed down on it. I mean when I would go out with friends I would not get it then I would eat it with my mom, that kind of thing but then eventually in college I just said "I'm done." For me it's not really a health thing to me it's a sad thing, it makes you sad. Eating meat. And I think it's kind of gross... When you think about what you're eating meat, like muscles, blood vessels, it kinda grosses you out. [NCA 542]</i>

Experiencing unpleasant encounters with animals	As a child I, um, had an issue with [bats] -I caught one caught in my hair...we were out in the country, we are at my sister's house, it was you know kind of like dusk, and they were dive-bombing us. They were like, swooping down and dive-bombing us, you know? I don't know whether we disturbed their area, we were out like right on the edge of the woods and what have you, and so we were coming back in. I was only about 10 years old, and I had really really really long hair, and it swooped down and got caught in my hair. And ever since then, I have this phobia, I've become incapacitated basically! [NCA 112]	I was playing in the yard when my dad was mowing one side of the yard, which naturally the frogs move – I stepped on one, squished it between my toes when I was little, I mean it was like - eeww! - my mom's like- it's actually a funny story, my dad died laughing to where he can't even breathe because he remembers it visually: my mom is chasing me around with the hose trying to spray my foot off, but every time I looked down I'd freak out and frantically start running, and she's chasing me with the hose - so frogs just gross me out, it's not - I know they can't hurt me, they don't scare me, but they just gross me out. [NCA 520]
Witnessing environmental abuse, pollution	We lived on a dirt road, so they would always come in and throw the old recycled oil just like down the road to keep the dust from coming up. And I remember thinking as a kid, "well that doesn't seem good". Why would they do that? You know, that's kinda gross, and uh...you know, I know before people knew any better they'd just dump oil out in the woods. [NCA 122(1)]	Um...the Indian on the TV commercial. I think that kinda goes with the degraded.... [S: Hmm. Like you remember seeing that commercial] Oh my gosh. Yeah. Vividly. It's still in my head, and I still think of that when I see, pollution and littering, and it's just like when I see something flying out of the window of a car. [CTR 550]
Recycling	My mom started recycling I think in the late 60s, maybe the 1970s somewhere around there, and I remember collecting the cans and the bottles, probably newspapers I don't remember, whatever taking them to the recycling center. And I made a comment one time...did I make a comment? No maybe I threw a glass bottle in the trash... and she made me get it out. [NCA 120]	So [my parents] made, what I recall as poor choices about some things like, um, whenever I first got on the recycling bandwagon, um, you know I tried to get them to recycle and they just didn't see why it was worth their time to do it. And now they recycle everything. [NCA 155]
Reading a book about environmental issues	I just read a book about how the Smokey Mountain National Park was started. That was interesting. [NCA 123]	I used to read a lot; I used to read everything across the board. And I would stumble across environmental issues, but I think that reading and writing are sort of intimate experiences – it's the same idea as when you sort of make a connection with a wild animal in nature. I think that reading somebody's thoughts that they've put together on environmental issues and these sorts of things is an intimate personal connection. A one-on-one conversation regarding those issues, and that I think is a really significant experience too. [NCA 155]

Working in an environmental profession	<i>I always wanted to be a veterinarian; I wanted to be a research biologist, all those really cool things that are involved with science when I was a kid. But I was also an artist, and I just found this way to marry the two...I didn't have the grades in science and math [laughs], you know things that could take me into science. So, I followed my art path and I found a place that I could work science as well, and be exposed, and get as deep into something as I wanted, finding somebody that I could work with over time that... helped with my science education, and I'm helping with her visual presentation. [DLC 42]</i>	<i>Visiting zoos and aquariums, and animal centers and stuff like that. That's a really big part cause I love animals, loved going to them ever since I was little itty bitty. And I always grew up saying, 'I'm gonna work at a zoo someday.' and I did it when I was 15, I went and worked at a zoo. So I felt like that was an accomplishment for me, that I set the goal when I was a little kid, like whenever I got asked, "what do you want to do when you grow up?" and you know sometimes you say I want to be an astronaut or firefighter or a police officer kind of thing. I was like, I want to be a zoo keeper. Or I want to be a zoologist. Some teachers were surprised that I even knew what zoology was, or could spell it in like third or second grade. [NCA 521]</i>
Seeing animals at the circus or in other entertainment shows	<i>I just remember being younger and just seeing some of the circus animals, not all of them, just a couple of them were just like, really timid in their cages and even when they were in performing their little ears are back and they're scared as can be. And you know, they're scared to walk or do anything, just like "oh my goodness that animal does not even want to be there and I'm sitting here watching this why did I pay for this?" [NCA 114]</i>	<i>I haven't been to the circus since I was a little girl, it's a kind wasn't, you know, horrendous that I know- I've seen through the news and things like that, lots of abuses that go on at these circuses and so as a result I never took my daughter to the circus growing up. [DLC 549]</i>
Feeding wild animals	<i>I was always out in the woods too, and there'd be deer in the yard every morning, turkey and stuff like that. So it's just around all the time and it was cool to see a calf every now and then and just... you know, we would throw some chicken scraps out there every once in a while and feed the fox... [CTR 116(2)]</i>	<i>The [hunting] lodge was smacked out in the middle of the woods, and there was a stall in the front yard where we could feed animals. So we'd put like leftovers or like ears of corn in there and we'd wait for nightfall. One night a bear came up to the edge of the porch and put its front paws on the stone ledge and raised up on its hind legs and growled at everyone. My dad said he never saw that many people try to get through the front door all at once! [CTR 532]</i>
Observing wild animals in the wild	<i>I was a girl scout and did lots of hiking so I saw animals like bears and snakes and things like that, I seen some beavers too, in the wild and I just like to sit and watch them. [NCA 123]</i>	<i>We spend a lot of time in Wisconsin and also here, feeding birds and watching birds - watched two nestful of bluebirds hatch out of the same box this summer...And it's just pleasant too, as entertainment. It'd be a shame not to have that. [CTR 554]</i>

Learning about the environment from a loved one/mentor	<i>I grew up on a farm, and we always had animals, and I had parents that believed you cared for your animals. I mean, when I grew up on a farm we grew, I mean my parents raised our food. And that was a hard. That was a hard thing even for my father, it was hard for him to feed an animal every day and then have to turn around and kill it for food. That was hard for him. And I guess I just... inherited some of that. [laughs] [NCA 110]</i>	<i>But [my dad] taught me about gardening, because we had our own garden with potatoes, vegetables. And we had a lawn, which was mostly weeds, but he would mow. And then he would have to jump off the trees sometimes and get baby birds- my dad was kind of a big burly guy, he would be like getting mad at the cat and ran after the cat. And I'm like that's weird; he's like this big guy saving a baby bird. [DLC 145]</i>
Volunteer work with environmental organizations	<i>I kind of grew up around it, my mom has always been a huge dog person, she's worked at rescues and stuff, and so it's kind of been something that I took on so I've worked - you know I volunteered at shelters. [DLC 67]</i>	<i>I've done some natural history talks and this Core Sound museum down here; I'm more involved in now and have been very involved in the Maritime Museum. [NCA 523]</i>
Attending summer camp	<i>added during pretest</i>	<i>As a kid, I did go to a summer camp in Wilmington. I think it was middle-school, early high school. It was like a week-long marine-biology camp and we did little projects. I remember doing one on the little mussels that ... I forgot what they're called, you know how the waves wash up in the little... it was just, I loved it! You know, which I realize probably wasn't what normal kids did. [NCA 184]</i>
Watching nature programs on TV	<i>added during pretest</i>	<i>I tend to watch like maybe 1 to 2 nature-related programs a week on Netflix. Like there was this one program on animal friendships which I guess is like an emerging field of research? It centers on captive animals, animals that have lived in captivity all their lives. All of their needs are met, they're fed, you know they're given space to grow. And they're introduced to animals of different species, either by chance or by design, or what have you. And these animals, often mammals, end up being cool would each other, like there's a dog and a deer playing around, there's a tiger and a lion and a bear all chilling because they grew up together. [CTR 541]</i>
Other (make your own card)	N/A	NONE

Change

After interviewees sorted the cards, I asked them how they felt their relationship with the environment or their views on it had changed over time. I saw several main ways in which people perceived change.

First, participants feel more aware of environmental issues as they get older. This awareness included an increasing valuation of the environment, as well as more personal ascription of responsibility and an increasing sense of agency for positive environmental impact:

“I guess yeah, maybe I've always had respect [for the environment], but maybe it's become more so- I become more cognizant of my own behaviors, and tried to change those, as I've grown up and realized- and I start realizing how what I do can impact the environment.” (DLC learner 37)

“Well I think that were slowly becoming more aware that nothing is indefinite. You know, everything comes to an end at one point or another, and the more you conserve, the longer you have it... You take better care of things instead of just banging something up and then just not worrying about it, you respect things a lot better, then they last a lot longer.” (CTR learner 71)

In addition to awareness, interviewees also identified increases in their conviction over time:

“I think it just got stronger over time. I've always, like I think I've always really liked animals a lot and had um... We probably didn't recycle as much growing up, but it wasn't a thing as much, you know. My recycling has increased I'm sure over the last few decades and um, I'm a few decades old. [Laughter] You know I think as we've been able to recycle more and do more, I've got a stronger opinion about it. And I think to the animals, I've always been very - you need to treat them well. But I think, I don't think I've shifted, I think maybe it's just gotten stronger as I've learned to work.” (NCA learner 542)

“I probably feel more strongly now, of course...I have three children, so when they were growing up, you sort of focused on the children. We camped and did things with them. And all of them are very aware of nature and the environment and so forth. So they're strong advocates for taking care of the earth. Because I'm retired now, and I have more time, I feel more strongly about these things because I get to read more, and I also have time to be more [politically] active.” (CTR learner 571)

These individuals feel both an increase in their personal conviction in their beliefs, but they also perceive again that as they get older they have a better work ethic to put towards tackling

environmental issues. So the trajectory is again always towards more care and conviction – none of my interviewees stated that as they have gotten older, they have become more realistic, pragmatic, tempered, etc.; if anything, they have become more radical in their thinking.

Other interviewees reported an increase in sensitivity. Most frequently, interviewees saw this sensitivity manifest as an increasing difficulty with eating meat. At least seven respondents discussed issues with meat:

“That’s been something that just recently [happened], I made a conscious decision to just eat fish, no more meat. Although I love meat. I mean I love chicken and turkey. But I think it’s mainly because there’s more media out there showing how the animals are being treated. So before we always had bratwurst, which was always made out of veal. I had no idea how veal was kept. If I knew that I would’ve not eaten that.” (DLC learner 145)

“Yeah, I don’t eat meat anymore. And a lot of that is because of treatment of cows and chickens. [S: So when did you become a vegetarian?] About a year ago. I was talking to my kids about it last night...and my son at [college] took that course; a lot of it was about that. And so, it kinda reinforced my decision. He’s like; “I was thinking about, I’m almost thinking about being a vegetarian!” And, you know, it’s something that I’ve thought about for years, before I’ve actually decided to do it.” (NCA learner 184)

This second interviewee highlights the lengthy process involved with making the big decision to stop eating meat, indicating that repeated exposure to the concept was necessary to create action.

Finally, a few interviewees spoke directly to the theoretical concept of expanding one’s moral circle to include the non-human world:

“I think it shifted as exposure to the world. The more you get out, the more you see, and the more you understand it’s all interconnected. And the more compassionate you become for it.” (NCA learner 517)

“I guess it’s broader. You know, I started out with this is our camp, and this is my dog, and I don’t want to see anything happen to either one of them. And I’ve been able to take a wider perspective, include more people, more species. I think that’s common in anybody as they age, more knowledge gives you more insight, as your brain matures you can grasp a lot of concepts.” (CTR learner 551)

This last quote encapsulates one of the main concepts driving this research project: expanding one's moral circle beyond the self is a process that takes time and repeated exposure to the lives and needs of entities outside the self.

4.3.3. VBN in the interviews

Interviewees provided detailed descriptions of their personal environmental values, beliefs, and norms. Interviewees spoke about general environmental values as well as concepts focused specifically on animals, which can help improve understanding of how VBN theory can be applied to animal-themed education contexts.

Values

The biospheric, altruistic, and egotistic perspectives all surfaced during interviews. However, coding values separately from beliefs proved to be quite difficult because the two concepts are heavily intertwined in practice; rarely does one state the value of the object without the beliefs that provide the context for the values. Thus, I start by separating out some basic values statements, but with the caveat that values play a prominent role in the beliefs section of this chapter as well.

Egotistic values surfaced via emphasis of the personal enjoyment interviewees feel in engaging in activities:

“And that you know, this could be your last chance to see one, you know, over the next 25 to 50 years there might not be any left.” (CTR learner 71)

“I mean just in general, I like to learn new things so from a personal perspective, from a selfish perspective, I just like learning things, I like to see the animals; what they look like, what they do, you know.” (NCA learner 542)

The egotistic orientation arose specifically in relation to the acts of *experiencing* and *learning*, in which participants acknowledge their own desire to be with the animals or to be out in nature.

Altruistic values arose during interviews most prominently as a belief in inter-generational equity. This type of equity is a direct extension of the aforementioned egotistic values, in that interviewees specifically focused on future generations' ability to see these animals as well:

"I feel like in the grand scheme of things, I don't want my kids or my grandkids to not experience some of the things that I got to, just because people got too greedy." (DLC learner 67)

"Even before I had a baby, there's other generations after us. I don't want them to live in a world amongst... millions of water bottles. And I feel like we're in a very disposable environment. In the trash will just keep on piling up. I don't know where will be when I'm older, or when my baby's older, you know I don't know but I think little stuff like that can help." (DLC learner 53)

"The odds of my grandkids, I don't know, I assume they're not going to make it to India. They may, but one wouldn't assume so. And so, they would never have the opportunity to see a tiger. It's part of understanding who we are." (CTR learner 41)

The last quote reinforces the human-centrism of altruistic values by emphasizing how seeing tigers helps us understand ourselves as humans.

Finally, interviewees supported biospheric values primarily using rights-based language; participants articulated the idea that animals have a right to life:

"Well, I kind of have a hard time figuring out why they need to be important. You know, it's like they are- they just are important. 'Cause they're alive. And why do we have the right to say whether they're important or not, you know?" (DLC learner 42)

"Animals have just a right to be here just as we do, our brain is more developed at more advanced than other animals, right now I just think we got lucky that we're on top of food chain in a sense." (NCA learner 521)

"I mean, you may laugh at me, but they're God's creatures just like we are! And we don't have a right to go out and just have fun, is what we were doing, and endanger that species of life... animals are important to me, personally. I don't guess we do, even though we think we do, we don't have any more right to be living here than they do." (NCA learner 110)

Beliefs

I coded interview transcripts for the four main dimensions of the New Ecological Paradigm: ecological limits to growth, fear of ecological crisis, inappropriateness of human dominion over

nature, and fragility of nature's balance (Roberts and Bacon 1997). I found examples of all of these in interviews, but the dimensions were heavily intertwined. So while they may emerge as separate dimensions in a quantitative form, they flow together quite seamlessly in a qualitative context. In some ways, they represent a single narrative line: nature is interconnected and in balance, it's not our job to interfere, but if we do, there are limits to how much we can interfere before crisis ensues.

First, interviewees frequently discussed the concept of ecological interconnectedness:

"Everything that I do impacts my world. So in having a conversation with you, whether I decide to throw this cup away, everything that I do impacts my world. It needs to be in my background, as part of my white noise. What I make a decision to... Purchase a larger car than I need, I need to own what I'm doing. Not necessarily disallow myself from doing it, but not rationalize myself into a place of accepting it and saying that it's not really bad behavior - no no no no - I mean, as a human being I don't have to be perfect. But I make an impact. And I exchange oxygen for carbon dioxide." (DLC learner 543)

"I think between them and myself, I mean everything's intertwined in my mind, every, every piece of this world is intertwined and has an effect on another part of the planet, the vegetation, animals, whatever it is. We're all connected somehow." (CTR learner 566)

"I think the underlying messages are similar, basically you just can't trash the environment, it will eventually catch up to you. You know, "you" being the human race. It may not be until your great grandkids or something like that, but it will catch up." (NCA learner 120)

"There's a lot of deer. [Some had] wasting disease... That population is stressed. You see a lot of wild turkeys. You didn't any and now they're coming back. I mean you see cycles over a period of time, it's interesting. And certainly there's an interdependence of one thing on another and...but then when things disappear, like pheasants disappear they don't come back." (CTR learner 554)

The last two quotes alluded to the risks of changing the system, suggesting that human dominion over nature is inappropriate. This segues into the idea of a slippery slope, which is related to ecological interconnectedness:

"If you lose one you start to lose more. And then it becomes, you know the more you lose the more it becomes acceptable to lose. You know, it doesn't become a big deal and people become desensitized to the problems that are surrounding them." (CTR learner 41)

Interviewees expressed concern about a potential ecological crisis, which flows from the belief in the delicate balance of nature. While not every interviewee discussed this concept, I only had one interviewee profess a belief in limitless human ingenuity's ability to solve ecological problems (a belief in line with the Dominant Social Paradigm); all other interviewees expressed more concern about humankind's ability to destroy itself:

“In thinking in terms of the vast universe, in thinking of terms of the last millions and millions of years has been going on, I believe that we are but a speck. Just a speck. I believe that there will be - I personally believe that we are just going to self-destruct. We're doing such a good job, I think, you know the fracking, you know people in countries where they don't have adequate food, they're chopping down trees, and limiting the space for wild animals - I'm getting all revved up here and I forgot your question!” (CTR learner 553)

“Well, I think a lot about – now that my kids are young adults -, you know, I think a lot about the earth. I think a lot about the ocean, and you know, are we gonna destroy it? You know, not just the seafood, but the ocean itself. You know... [S: Do you think we will?] Well, I don't, not in my lifetime. But, you know, I...I'm concerned.” (NCA learner 184)

“And that's why you know, I get depressed about it, like what's this going to look like? I mean yeah, we're doing all these great stuff, but what have we done to the planet and ourselves ultimately, you know, really it's the way I look at it. Not to be totally negative. It's basically – we've orchestrated our own destruction [laughs].” (CTR learner 556)

“I honestly think that the world will not learn, society will not learn until it comes to a screeching halt, or it comes to the point where people are screaming Armageddon because things are so bad. I think it will take us literally, for our empires to fall, and fall back, before we start finally realizing the importance of nature, and how much we depend on it, and how much we take it for granted.” (NCA learner 521)

Overall, interviewees expressed a distinct adherence to the New Ecological Paradigm. Even for politically conservative individuals who were not self-identified environmentalists, the ecological worldview was the highly dominant belief system in my interviewee sample.

The liberal-conservative divide

Many environmental issues are highly politically polarizing (McCright and Dunlap 2011), but all of my interviewees expressed pro-environment sentiments, regardless of political orientation. The starkest example was one highly opinionated republican who spent much of the

interview berating President Obama, liberals, and environmentalists for what he perceived to be irrational and damaging environmental policies. However, this individual also expressed dislike for wastefulness, so in effect their behaviors are similar to the self-professed environmentalists in my sample:

“I try to recycle. I try not to waste resources. I'm careful with the amount of electricity I use. But I'm sure not going to get an electrical car! And I don't drive and SUV either. Why have a heavier vehicle that you don't really need? I think a lighter vehicle is more in line, and SUV's are very wasteful. They weigh 500-1000 pounds more. Uh, food. I try to not be wasteful with food. And I can see benefits from insulating your house. Just practical ways.” (DLC learner 39)

Another example comes from a libertarian who uses his vote to support environmental candidates:

“Well I do my part with respect to recycling and things like that, try not to waste food and things of that nature. I try to do my own part in my own home, um... I don't - I don't vote for people in less I know they're supportive of the environment, but obviously it's hard to- they don't tell the truth all the time! (CTR learner 550)

Finally, a business-oriented person who also sees the value of working with the environment:

“My family has always been very independent and very business oriented. And it's very difficult to mesh the environment with business. You have to be very broad-minded to do that, because you tend to look at the business point of, what's the best for the bottom line? And in today's world, you're seeing that your bottom line is tied with the environment, can be very beneficial to each other.” (NCA learner 517)

In my interviewee sample, even politically conservative interviewees expressed support for environmental protection and/or an interest in engaging in pro-environmental behavior.

Animal welfare

Animal welfare was a prominent topic during learner interviews. Without exception, all interviewees consider animal cruelty to be unacceptable. However, interviewees held more nuanced views regarding other aspects of animal welfare.

First, even though the purpose of visiting all three of my sites is to see animals in captivity, many interviewees expressed strong qualifiers for the justification of animals in captivity. The

majority of interviewees expressed general struggles with seeing animals in captivity, but their descriptions suggest that they are assessing each organization they visit based on a combination of the institutional mission (why they keep the animals) and the quality of the care they perceive at the facility. But in all of these cases, their experience *depends* on these criteria being met:

“There's always this- I guess internal battle, you know seeing animals in cages, in a caged atmosphere, and you know knowing that that's not their natural habitat, and it's hard. I'm sure there are people studying the stresses on the animals in the cage vs. free, and how much they actually realize that's not where they should be... So it's always hard to balance that out, also wanting to maintain some genetic diversity, by keeping lemurs that are going to be protected, and so... it's the same thing with zoos for me, kind of an internal battle.” (DLC learner 37)

“Anytime you see animals in... cages, it's a little disheartening. I mean, 'cause that's one of the things I always liked about the North Carolina Zoo is that while the animals sometimes were farther away, like actually it wasn't an elephant in a cage. They have a good area to roam around. But I know [DLC's] space is limited and all that – like I said, I did like that they had the free-range, [the lemurs] came and visited us before the tour started.” (DLC learner 549)

“I remember the Stone Zoo in Massachusetts, it was one where all the cages were small and habitats were dreadful, and Audubon Zoo was at least somewhat considerate of the animal but I never really liked the idea, because I read about them, see them in their natural habitat, you know and these huge trees and rocks and places for it to have an area on a ledge two thousand feet above, above, instead of a box. I'm not a big fan of animals caged but the cats place – that's one thing, they couldn't exist their habitat.” (CTR learner 550)

“I mean we visited zoos, and I do think about that. I mean it appears that they are well taken care of. I don't think that upsets me too bad. As long as I know that they cared for. But I do think about that! But then again, you know, if we didn't have them in exhibits like that, we probably wouldn't learn nearly as much, is what I've learned.” (NCA learner 110)

“It depends on the animal, and it depends on, the on the situation... I mean they had some really huge tanks, you know, and you don't feel quite so bad about something like that, you know when they have so much space, you know, it's not like, you know, an elephant in the circus that gets tied to a stake, and they're not allowed to move from that stake, and they get beaten, that makes me sad, but you know, I didn't get that vibe, I didn't get that feel when I was there. You know, it seemed like the spaces were big and were open and also going behind the scenes to actually see – 'cause you only see a flat front on these tanks, you don't have a clue as to how actually huge they are, so that was, that was a very good perspective as well. Going behind the scenes to say, oh well this isn't just a little teeny tiny tank this tank is humongous.” (NCA learner 112)

“For species that are under the threat of extinction, we need a captive breeding program. And we being probably the US, no one else's gonna do it. Um, that doesn't mean we keep it going forever, that means that we get the numbers back up and try to reintroduce them into the wild.”

And see how it takes. We're seeing it work with the wolves, we're seeing it work uh, with elk. Um... that's the only way will save a number of these species. So yeah, there is - there is value in captive breeding, but it has to be... captive breeding with a reason." (CTR learner 41)

These quotes illustrate my interviewees' high levels of concern for animals in captivity, and their need for organizations to demonstrate adequate purpose and quality care.

Building on the need to justify captive conditions, several individuals commented on disliking other types of captivity, mostly zoos, lending support to the idea that different places give different niches:

"I'm not a big fan of aquariums, it's like, if you think about - again, I think we should be in our natural habitat, granted we have domestic cat here, but this, this is kind of her natural habitat now." (CTR learner 550)

"I mean, I love the Aquarium. I'm not so much of zoo person... I don't know, I'm just a water person." (NCA learner 184)

"We've just joined the, the Tiger Rescue. And I've thought about joining the zoo and I just haven't done that. And I have mixed feelings about zoos. I mean, in that, you know, I'm glad there are zoos, but I'm also sad that those animals are not out in the wild." (CTR learner 571)

"Well I think, I think it certainly tied into, you know, I guess more along the lines of the zoos and aquariums. And I'm not quite into zoos, but I mean you know, actually getting to observe a different kind of wildlife, you know, that I really had no prior knowledge of." (DLC learner 552)

"I'm kind of iffy on [zoos and aquariums] because I don't, I probably don't know a lot about them all. And for instance, Carolina Tiger Rescue, it's not really a zoo, but it's similar to that in that it has animals somewhat in captivity. But it's also more purpose and something good, from what I can tell anyway." (CTR learner 566)

Religion and Stewardship

Even though I did not ask about religious beliefs directly, this concept quickly became a pervasive theme in my interviews. At least 15 of my interviewees cited Christian underpinnings for their beliefs. Sometimes interviewees justified their environmental beliefs by evoking the general sanctity of all beings because they are God's creation:

"Well I guess it's cause we're all God's creatures, and deserve the right to our spaces and what have you... I guess it's a whole... Oh how do I want to put this? It's like an ecosystem, and when

you disrupt part of that system, whatever it is, whatever part of it it is, the whole thing doesn't run well, doesn't you know, you need that balance, of, of you know everything. So and when something gets way out of balance, whatever that is, it has a tendency to throw the whole system off.” (NCA learner 112)

“I’m a liberal politically, and I’m a liberal religiously. But within my religious background it’s very much important to take care of the earth and the people in the earth. And the legislature is driving me bananas; I was arrested in June... I did the Moral Monday. So I just, I feel very strongly about my responsibility towards all of God’s creatures” (CTR learner 571)

However, in other cases, interviewees specifically state the belief that God gives us dominion over animals, conjuring a hierarchical model:

“Well I feel we're a part of nature, 'course, you know I brought a group from church, so my thoughts are kind of- based on my faith, you know I believe that God made us all, and, he didn't make man separate, but I mean we are all part of his creation, and it's our job, God gave us that commands to be good stewards of his creation.” (DLC learner 49)

“I think animals were given to us in nature by God to enhance our lives, but we have a responsibility not to misuse them. But we are their keepers, and they are for our benefit. But that doesn't give us the right to be cruel, or not take care of them in any manner. In fact, just the opposite.” (DLC learner 39)

“I guess that goes back to the, you know, we're the superiors and we have an obligation to treat them well, and if somebody has bred them in captivity and missed treated them, then somebody needs to step up and make that right.” (CTR learner 551)

“And I know that, you know, the Bible says that God gave Adam dominion over the animals, and that the animals were put here for us to use. But I think there’s a difference between using them and, and mistreating them.” (NCA learner 518)

The faith-based reasoning posits that all of God’s creatures have value, but the stewardship responsibility emphasizes the belief that humans have dominion over animals. Placing humans in a higher position was further emphasized by two of the above interviewees when discussing priorities with animals and humans:

“Animals need to be taken care of, uh, but I really think, uh, the money spent on pets in the United States could go to a much better cause. [S: What do you think would be a better cause in that case?] Taking care of humans. Cancer research. Uh, disease research, contributing to offerings. Needy mothers. The money spent on pets could go a long way to alleviating a lot of human suffering in the United States as well as around the world.” (DLC learner 39)

“I'm educated enough to know intellectually they're not our equals, which means emotionally they are not sophisticated enough to be our equals, and I'm enough of a pragmatist to feel that there are other bigger issues in the world that supersede whether every dog has a clean bed to sleep in or not. You know you have to draw the line somewhere, I guess. And I'm comfortable with the line that says, keep your priorities in order, you know the hungry people come before the animals with dirty beds, it's kind of the way I feel about it.” (CTR learner 551)

Environmental norms and behaviors

I asked interviewees to identify the most important behaviors to help the environment and to assess how they perform on those behaviors. While most interviewees mentioned traditional environmental behaviors such as reduce/reuse/recycle, other interviewees go well beyond what might be considered basic ecologically friendly behaviors. Behaviors from all four categories of the VBN framework's behavioral categories were mentioned: private sphere behaviors, activism, public non-activist behaviors, and behavior in organizations.

As for private sphere behaviors, interviewees cited recycling more than any other behavior as one of the most important things one could do for the environment. Recycling was a big topic of discussion in both Round 1 and Round 2: out of 47 interviewees, 42(89%) mentioned recycling. No interviewees questioned the efficacy of recycling. Instead, it was mostly used as an indicator that they are doing an okay or good job environmentally.

“The most critical that we do? I would say recycling but it's not just in, you know putting plastics or tin cans of the recyclable bin. I think it has a lot like- recycling, of play sets, you know like going to the next level of recycling and not just – even going to consignment stores and you know buying clothes that way instead of buying them all new. I do it for the baby, baby clothes at the consignment store more than anything, or like her toys or anything like that... so I would say, but I don't know if that falls under recycling but that's what I would say.” (DLC learner 53)

“I mean for me one of the biggest things is recycling, and reusing. Because, um... I - that's just a problem [laughs]. That's a huge problem I think, all across the whole world, but um, I think in the US we have a tendency to... Feel that things are just usable, and then you can throw them away and then you don't think about the ramifications of how that affects plants, animals, even us as people, things like that. So I definitely recycle the best I can, you know I've taught my kids to recycle, conserve water... you know we try to reuse as much as we can, when we are done with something, like we're done with a toy or we're done with our own clothes, we try to give it to somebody we know, or do something like that. I think that has a huge effect.” (DLC learner 43)

These interviewees speak to the more general concept of recycling and conserving resources as a way of thinking, as opposed to a specific municipal program.

The majority of interviewees did not mention activist behavior, but at least five individuals mentioned some kind of political work they engage in for the environment or animals:

"I only just recently met with our County Rep, McManus, about the puppy mill bill....And it only started because HSUS site rep asked people from the county to please get in touch with their state and house reps, and she does great stuff, she is a complete animal lover, and that's common sense, which is great... So yeah, that's really the second time I've been involved politically, usually I think I'm a little too emotional, so I just let the professionals do it [laughs]" (DLC learner 145)

"A lot of our resources, I think, in the next couple of years are going to be towards possibly electing people who are more...um...cognizant, and willing to pass regulations that support environmental issues. I mean, what they've done to DENR, they're undermining some of the very departments that are supposed to be...yeah." (CTR learner 571)

In lieu of activism, interviewees expressed willingness to engage in non-activist behavior in the public sphere, namely supporting environmental causes:

"One of the things we donate money to is an organization called 'Student Conservation Association.' And the reason I do that is quite frankly...it gives somebody an opportunity to appreciate a national park, a national forest wherever they go for that summer, and more than likely it'll be a very good experience which means they will probably end up being an [advocate] for the environment and they wouldn't have possibly have been otherwise. So it, it's not so much what can I do in the sense of recycling, which I do it's how can I spread that to other people. And that's one of the ways I found to spread that." (NCA learner 118)

"[I support] the Sea shepherds. I have supported them and donated to them for protection against the whales. Basically they're kind of like Greenpeace on, I don't know, a lot of lobster juice [both laugh], they did have a TV program but they are, I don't know if you remember Greenpeace way back in the day how militant they were? The Sea shepherds are pretty much the same thing."(CTR learner 71)

In addition to giving money, a few interviewees mentioned volunteering with other groups, although about half of those who mentioned volunteering engage with organizations that are more humanitarian than environmental.

“I sit on the fundraising board for the annual fund at the [science museum], so I always get involved with raising money for them, ‘cause the annual fund is what keeps the doors open, keeps the animals...” (NCA learner 520)

Interviewees rarely mentioned behavior in organizations, but at least three individuals mentioned making environmental decisions in their workplace:

“I work for a hotel company, in our hotels we serve breakfast to the guests, and in America we serve it on Styrofoam, or least we used to right? So, in Canada, that was unheard of. No, you use real China, real plates, real silverware, you reuse that kind of stuff... so, you know, I thought Styrofoam plates were fine, plastic silverware? Fine! And they were like, no, no! Look at what you're doing to the environment! And we changed it down here in the states, now all 500 of our hotels now have all China.” (DLC learner 53)

Self-assessments of environmental behaviors

Regardless of the actual environmental behaviors individuals reported, interviewees assessed themselves as, “pretty good, but could do better.” In the following examples, interviewees assess themselves in this way, and their behaviors are mostly along the lines of recycling, and general energy/water conservation:

“On the scale of- I'd say I would do pretty well, I recycle, and when I go on walks a lot of the time I like to pick up trash, if it's not too difficult to in like, my hands.” (DLC learner 67)

“I would say I rate decent on all of that. I do eat meat, and my sister is a vegetarian, and so I know that the practices, the effects of eating meat is bad for the environment generally speaking, and bad for treatment to animals generally speaking. And that's just a selfish personal choice that I make on an almost daily basis. But I do try to buy meat that's locally sourced and has been treated in a humane fashion. We try to, my father and mother have always been massive proponents of recycling, almost everything in our house is somehow recycled, or you know, it's almost a little kooky at times, but we were the family before Raleigh got these giant blue bins, so we need like 3 or 4 recycling bins because of the amount of stuff that we recycled. But I drive a low emissions car, I get good gas mileage, and that's something more so - that's something I've been doing for a number of years.” (CTR learner 58)

“Water conservation. Try to recycle as much as we possibly can, things like bottles and cans. Try to use things that are a little bit more sensitive to the environment as far as chemical products, you know. Try to basically, we call it cleaning up our act a little bit as far as recycling. I guess just little things - carpooling as much as we can, taking shorter trips. And just, I guess the term they're using now is leaving smaller footprints. [S: And what is your self-assessment on how well you're doing with those things?] We're doing okay. We should do better, there's always room for improvement.” (CTR learner 71)

“I like to say, that I was green before it was popular to be green! And even the cardboard boxes that we buy for the office for our shipping, we try to buy recycled packaging. You might pay a little bit more for it, but I figure it's offset by the amount that I'm not spending on packing material. So we do a lot of things like that. I could probably do even more here at the house, you know with the recycling, some of the cans and stuff. Sometimes I'll just say oh, you know I don't want to take the time to do this, I'll just pitch it instead, that sort of thing. Probably could even be a little more conscious with water, of turning the water on and just letting it run while you're doing something, kind of forgetting that, oh! You're just like, the water is just running down the drain you know? Not paying attention to what you're doing and that kind of thing. So those are some things that we do, and that I think we could improve on.” (NCA learner 112)

“Conserving. Conserving electricity, conserving water. Little things, like when you're out and about if you see trash pick it up. I can't think of anything else. [S: And how would you rate yourself on those types of behaviors?] Yeah. I think I do a pretty good job with it. You now, I could always do better, especially in terms of conserving, like I probably could set the air conditioning a little bit higher than I do. I try to do that when we leave, whenever we can kind of set it higher. I think I do alright but I could always do better.” (DLC learner 194)

“I kind of feel like I'm middle-of-the-road, because I do do some things in terms of reduce recycle reuse, I know that I'm guilty of buying food out of season which means that it's not locally sourced, where it's not perhaps the best use - I know some of my friends are part of agricultural co-ops where they get things from local farms and get their weekly fruits and vegetable basket, which would be better, but it seems a little sort of hit and miss to me in terms of getting what I'm looking for, so I know that I could do better in that area.” (CTR learner 63)

Yet this last interviewee, after assessing their performance as middle of the road for not being a member of an agricultural co-operative, discusses a well-informed interest in purchasing solar cells. This suggests not a middle-of-the-road environmentalist, but one who is considering taking major steps for the environment:

“Yeah, and that's actually one of those things I've wanted to get is a set of solar cells, but I've heard that the waste from producing those and other waste when they're no longer usable ends up sort of negating their impact, or they still help you in terms of reducing how much power you need to pull from the grid, but with the waste concerns and also the fact that maybe you would need the solar cells at all if you just cut back on how much power you used.” (CTR learner 63)

The interviewee demonstrates great knowledge about pro-environment purchasing options, but because their community is similarly eco-minded, they do not see themselves as exceptional in this way. The following quote provides the most extreme of someone who assesses their

performance as “pretty good” even though they haven’t turned on the air conditioning this summer (the interview was conducted in Raleigh in August):

“I would try to think I do pretty good. You know, I shut down stuff all the time, with power strips, shut those things down, leave for work the morning. I try not to use, I'm not using the AC right now. I haven't been all summer really so far.” (CTR learner 566)

Are you an environmentalist?

I asked some participants if they considered themselves to be environmentalists. Most of them said no, but their assessment had less to do with their actual behaviors and more to do with how they defined an environmentalist. For example, if they thought of an environmentalist as a technical expert, then they did not consider themselves to be one:

“I wouldn't say that I'm an environmentalist just because I'm really not an expert in any which area. And I just try to do the best that I can but I don't think that by any means... I probably could do more than what I do. But I know that there are people out there that do a lot more, that I would say that's their specialty? I think that when you use the term environmentalist, it should be a specialty to you in a way. I mean I think everybody probably does a little bit of something to help out, but to me they're not environmentalists, that's somebody who really... I feel like if I was very meticulous and really checked every single label and did all that, then I would have the right to go out and say, well I'm an environmentalist, you should try to do the best you can, you know.” (DLC learner 43)

The last line of the quote suggests that the interviewee believes environmentalists have the right to be more of an authority figure because of their own investment in the environment, something that they don’t see themselves having the right to do.

For some interviewees, the definition of environmentalist included some level of effort towards environmental work, again something that they personally do not do:

“I just couldn't label with myself as an environmental person. Like, I like these spaces and I hope they continue to exist. But I think you really have to make some kind of effort to label yourself as like somebody that's environmentally motivated. And clearly, there's like nothing in my life that I'm [Laughter] on doing that. I'm just being very honest about that.” (DLC learner 531)

The next two quotes express their support for environmental causes, but make the distinction between more direct forms of environmental activism and their support of those things:

“I'm not involved in a Greenpeace or environmental group, but I feel strongly, so. I don't consider myself at one extreme, but I think I support those ideas.” (CTR learner 69)

“I can say that I don't spend my time - I don't put my money where my mouth is. I don't spend my time necessarily on issues such as this, or animal conservation, or environment. I've always been a person that appreciates all of those things, but I have never been one to necessarily get involved more, beyond that appreciation.” (CTR learner 58)

Overall, interviewees expressed positivity and support for environmental causes, but were hesitant to self-label as environmentalists if their definition focused on hardcore forms of environmental activism, something that few interviewees engage in directly.

Barriers to environmental behaviors

I asked interviewees why they do not get more involved with environmental issues, and they cited six main barriers: information, time, agency, money, priorities, and frustration (Table 4.9).

Table 4.9. Barriers to environmental behaviors.

Barrier	Learner quotes
Information	<i>“As far as the bigger environmental picture I'm not really sure what to do outside of recycling or just trying to limit waste I guess, more than anything.” (DLC 552)</i> <i>“I haven't taken myself to the next level. I'm doing what I learned, and I've adapted it to our lifestyle. And I would need to learn more so I could work on it... So the next step would be... learning about it and seeing if it's something that I agree with and that I could implement into our lifestyle.”(DLC 53)</i>
Time	<i>“There are just so many things on my plate. And taking care of animals is secondary to me. Secondary to the things I need to do throughout my life. Which is unfortunate to some degree, 'cause we're all part of this world, we're all in nature - it would be great if we could all take a little bit of time and care for it just a little bit. But you know circumstances as they may, always just piling up more and more. You know, you've got weddings, you've got kids, you've got work, you've got marketing for a website, writing- so much writing these days.” (CTR 541)</i> <i>“While I would love to volunteer and things like that, my daughter's still in high school, my life is not my own. I am the chauffeur, to the rising sophomore.” (DLC 549)</i>

Barrier	Learner quotes
Agency	<i>"I think my worry is more with our government body, our legislature, and the kinds of policy they set. And this council, city council...the people of towns, the builders, the people making those laws and all. I think they're the ones that have control... I've spent a lot of time out on the outer banks and the fishermen and the people out there, a lot of them are not concerned, they wanna drive their cars out there and they're not concerned about the piping plover, and the turtles, they're concerned about how many tourists are gonna come out there and fish, not these endangered animals and birds. So... I don't know what the answer is." (NCA 184)</i>
Money	<i>"And the food that's better for you tend to be more expensive, and that's kinda sad, because you're kind of driven- kind of pushed into making bad choices because you can't afford a good one." (CTR 69)</i>
Priorities	<i>"At this point, up to this point in my life I haven't donated a lot of money to different causes - usually the donations have been to extreme needs, like, Haiti or something drastic where money is needed... I guess for human lives." (DLC 37) "I don't wanna say [environmental issues rank] at absolute rock bottom...but I wouldn't say they're at the very top either. I'd say they're somewhere in between." (CTR 532)</i>
Frustration	<i>"I think there's just so much dissonance, that's why nothing can get accomplished. I think ultimately I see animals, and conservation and environment, as kind of a loser issue to be perfectly honest, because - well it's my impression that in the mind of the general public that there are so many other issues that ultimately hit them in their wallets, that they couldn't care less about the environment or animals. If it means they can save money on something else, and I think that's what it really boils down to. So, I think it's just frustration at the current state of affairs, why people like me don't get involved." (CTR learner 58)</i>

In sum, interviewees are juggling many opportunities and constraints, and the majority of interviewees can be described as supportive, but not active. Participants demonstrate high levels of awareness of pro-environmental behaviors, and while they engage in these behaviors as they can, they still hesitate to self-congratulate or self-identify as an environmentalist, as they do not see their commitment as serious enough to warrant those distinctions.

4.4. Discussion

Having both semi-structured interview and quantitative survey data helps me understand different aspects of the learner. The survey allowed me to generate a profile of the learners at each site and understand systematic differences in the populations of learners. The interviews

provided insight into some of the ways that people make meaning from their lives and construct their environmental belief systems. By and large, visitors already subscribe to an ecological paradigm, and they care about animals in the world; the experiences they cite are in fact quite similar to the SLE literature.

4.4.1. Profile of the interviewee

Because of the small sample of interviewees and the general nature of our discussions, I cannot make inferences about learners across sites using the interviews. However, I do see overarching themes universal to learners across all three sites. General beliefs include a sentiment of stewardship, an animal's right to a decent life, a concern for ecological crisis, and the belief in ecological interdependence; these arose in some form during almost all interviews. While few interviewees self-identify as environmental professionals or activists, broad environmental support exists across all three sites. While this result may have in part been driven by respondent self-selection, I also saw a sufficient amount of environmental apathy to suggest that not all participants were motivated to present an identity of an environmentally minded individual. While my inquiring about VBN during interviews might make learners appear more environmentally focused than they are in other contexts, our discussions still reflect some level of ascription to an ecological worldview; the general U.S. population has been moving toward the New Ecological Paradigm for 40 years (Dunlap 2008), and the audiences in these contexts are more environmentally conscious than the average American (Falk et al. 2009).

Most importantly, these pro-environmental themes were present in interviews with learners across the political spectrum, suggesting that individuals of different political backgrounds might agree more on environmental issues in an animal-themed context than they would in a more general environmental context. Everyone, even the most hardcore utilitarian,

saw the need for humankind to treat animals with respect and manage them sustainably. Animal welfare thus represents fertile grounds for developing connections across political divides regarding environmental values, beliefs, and norms. As learning about other environmental topics (such as climate change) have had a polarizing effect on the US population (Kahan et al. 2012), finding places where people with diverse views can learn about environmental topics in a shared space could be a critical way to bridge political gaps in environmental decision-making.

The moral status of animals represents a rich source of contemplation among visitors at all three sites. Previous work has shown that the relationship between animal welfare attitudes, animal activism, and vegetarianism are complex. In a study by Herzog and Golden (2009), half of the animal activists ate meat and half of the vegetarians were not animal activists, suggesting that the decision to become an activist or a vegetarian might be driven by other personal characteristics (in their study, they suggest visceral disgust as a potential driver). In my study, the Animal Attitudes Scale served as the metric for animal welfare, and I found that it was tightly correlated with NEP, suggesting that general ecological worldview is related to an animal welfare perspective. I also found that visitors at CTR had higher scores than NCA visitors, which also suggests that the welfare-focused mission of CTR might attract participants with a greater sensitivity to animal welfare issues.

Additionally, my interviewees expressed some apprehension about captivity in the zoo and/or aquarium context, again suggesting that context matters deeply. Interviewees viewed captivity as a grey area in which individual facilities are evaluated based on their animal care policies. This finding goes against previous AZA-sponsored research showing the public does not support critiques of zoos because of captivity concerns (Fraser et al. 2009), so this issue with captivity warrants further attention. If these specialty facilities are able to attract people who

believe zoos are unacceptable, this represents a whole different subset of the population that might be eager to learn about animals but not eager to support zoos. And while my data suggest that NCA visitors might also represent some portion of the population that is uncomfortable with zoos, more research is needed comparing zoos to aquariums; the literature tends to lump these two types of facilities together (i.e. Miller et al. 2004). This distinction is also critical to my analysis because at CTR and DLC, the concerned visitor only wants to see charismatic mammals under acceptable conditions, whereas at NCA the visitor is saying that they do not have a problem with seeing aquatic animals in these conditions, but they might not be comfortable seeing terrestrial animals in similar conditions. Thus, the educator's task is different in each place: DLC and CTR educators must convince the learner that the organization is doing good work, and NCA educators must convince the visitor that aquatic animals need as much care and consideration as terrestrial animals need.

The religious theme that emerged during my interviews has also been identified in the literature as a driving force in environmental beliefs. Fraser and colleagues (2009) interviewed religious leaders and identified religious narratives about nature as God's creation and the importance of stewardship. NEP research done in North Carolina found that the *man over nature* dimension was unique within the NEP scale because of its religious/hierarchical nature (Nooney et al. 2003). While I did not test for dimensionality in my survey data, interview data suggest that spiritual influences may play a large role in shaping environmental beliefs in audiences in this region. In particular, the Christian construct of human dominion over nature may play a critical role in shaping the environmental stewardship ethic in these audiences. More research would be needed in which religious data were collected on the survey in addition to the VBN metrics.

4.4.2. Comparisons across sites

My survey results show that while participants are similar along some demographic and VBN variables, they differ on other key variables, suggesting that each facility might be attracting a fundamentally different audience.

DLC is attracting fewer parties with children on their public programs than the other two facilities. The smaller number of parties with children could be related to DLC's focus on science and research, which might appear unsuitable for young children in the eyes of potential visitors. Additionally, DLC participants had visited more environmental/animal facilities in the last two years than visitors at NCA, suggesting that visitors visit DLC as part of a broader interest in environmental/animal facilities. To borrow ecological language, DLC might occupy the smallest niche in that their visitors have the most previous experience and knowledge about environmental activities of the three visitor populations.

AAS scores tracked along with relative welfare concerns for the species at each facility. In other words, the higher the concern for the welfare of those species, the higher the AAS scores in the audience. CTR visitors scored highest, followed by DLC, and NCA had the lowest AAS scores. In interviews, participants indicated that they are not equally comfortable seeing captive animals in any situation, viewing zoos in particular in a negative light; these two types of data put together suggest that individuals are choosing to attend LAIEs based on their levels of comfort with seeing animals in captivity, and that facilities like CTR where animal welfare is prominently featured may be capturing an audience unwilling to attend zoos and aquariums.

In addition to scoring highest on the AAS, CTR visitors also scored lower on the altruistic values scale than NCA visitors. If one considers anthropocentric values to be in conflict with biocentric values, then this result is not surprising, as the animals at NCA have the highest

human utilitarian value of any of the species housed at the three sites. However, one limitation of the AAS is that it does not distinguish between categories of animals. Taylor and Signal (2005) developed a pet/pest/profitable (PPP) animals scale in an attempt to capture more nuance in animal welfare beliefs, but the PPP does not effectively deal with wildlife. I argue that tigers, lemurs, and turtles are not pets, pests, or profitable, but that they provide value to society that could rival that of the other categories. Future research in this area could include the development of a more nuanced metric for determining what types of animals people value and why. Also, understanding the difference between large suites of species and smaller thematic clusters would also help dissect the nuance of how audiences decide they want to see certain types of animals.

The NCA audience was on average less educated and more politically conservative than audiences at CTR or DLC. Previous research has shown that these two demographic groups exhibit fewer environmentally minded tendencies than more liberal, educated individuals (Dunlap et al. 2000, Nooney et al. 2003). However, NCA visitors scored higher on their sense of personal responsibility than visitors at DLC. This result appeared in the naïve model and became even more pronounced when demographic variables were controlled for, suggesting that animal-themed educational opportunities may have the ability to either attract environmentalists across the political spectrum or activate environmental values that are not activated in the political arena. This result has implications for how educators approach a politically diverse audience. If environmental values are present and activated in learners across the political spectrum, perhaps educators can be more aggressive about promoting action competence in environmental conservation during LAIEs without alienating more politically conservative audience members.

Place attachment might also be a useful lens with which to view the differences between sites. Research has suggested that place attachment might better explain environmental attitudes than socio-demographic variables (Vorkinn and Riese 2001). Because NCA deals with local species in a beach context, they might be able to tap into a place-based values system, and this fact could be explaining the activation of personal responsibility in survey respondents at NCA.

The motivations expressed on the survey also reflect the different appeal of niche organizations. Participants at NCA were more likely to express specific interest, whereas DLC and CTR visitors expressed general curiosity about the organization. This difference suggests that audiences at niche organizations are primed to hear about the work of the organization, whereas visitors at zoos and aquariums are more familiar with the institutional context and are expecting more specific animal-themed programming. While both positions have constraints and opportunities, this result supports the choices made at both CTR and DLC to focus heavily on their own work, as their work is what attracts learners to their programs.

4.4.3. Comparisons with other populations

The people in my samples across all three sites tended to be older and more wealthy than the average AZA⁷ visitor (Khalil and Ardoin 2011). While one of my sites is AZA-accredited, the act of signing up for a guided program might sort NCA LAIE participants into a niche population similar to CTR and DLC. The extra amount of investment required could be partially financially driven (although a DLC tour is only \$2 more than a general visit to NCA), but it might indicate that signing up for a guided tour at any location might select for individuals with more investment in the topic, more experience with animal-themed experiences, or more information on what kind of educational programming is available. Thus, visitors at my sites

⁷ Association of Zoos and Aquariums

might be older and wealthier than the average zoo or aquarium visitor because it takes more time and resources to develop an interest in a specialty organization or a specialty tour. Previous research has shown that young, well-educated, liberal females are more environmentally minded than their opposing demographic groups (Dunlap et al. 2000, Taylor and Signal 2005). My regression models supported some of these previous results, but not others. In support of previous research, political orientation and gender proved to be the most consistent predictors of VBN characteristics in the expected directions. Yet older participants in my study had significantly higher biospheric values and personal responsibility scores and lower egotistic values scores than younger respondents, which goes against predicted relationships between age and VBN scores. My interview data support my survey data in this area: when discussing changes over time, participants spoke of an increased awareness of the environment and conviction in their environmental beliefs. This is an interesting result, as many scholars would attribute a shift towards more ecologically minded beliefs to societal changes which have occurred over the last century (Dunlap 2008). For example, the treatment of animals as emerged as a contentious social issue only in the last three decades (Knight and Herzog 2009), and the Dominant Social Paradigm has declined in favor of the NEP for the last 30 years (Dunlap et al. 2000). If these trends were driving my data, then in this cross-sectional sample, young people should still score higher on ecological values because of a cohort effect, but my data display an opposite trend. However, as Millennials may exhibit more narcissistic tendencies than previous generations (Twenge 2006, Bourke 2010), perhaps opposing societal trends are increasingly complicating the relationship between age and environmental VBN. More data is needed to understand how aging and cohort effects determine VBN scores in learner populations.

Egotistic values orientations have proven to be important in looking at other environmental psycho-social measures of environmental beliefs. However, the literature is unclear on whether the emphasis on egotistic values will strengthen one's commitment or weaken it, because egotistic values will depend heavily on the external environment (Milfont, Sibley and Duckitt 2010, Schultz et al. 2005). If it is in one's best interests to not drive a car (as might be the case in NYC), then an egotistic person will make an ecologically friendly choice- on the other hand, if it is inconvenient to do so, they will not (De Groot and Steg 2007a). My survey results show that the directionality and predictability of the relationship between egotistic, altruistic, and biospheric values and any of the independent variables in the model is unpredictable, with both positive and negative relationships between the three values scales on any given dependent VBN variable. This could mean one of two things: first, it could mean that the dimensionality along these three values orientations is weaker in my sample than has been demonstrated in previous studies (de Groot and Steg 2008). Second, if egocentric statements might be considered socially undesirable, the fact that including one's contact information was one of the strongest predictors of VBN variables in Chapter 4 indicates that social desirability might be biasing these results (Nederhof 1985).

4.4.4. Norms and behavior

Because self-reported behavior has not proven to always be an effective measure of environmental behavior (Gatersleben, Steg and Vlek 2002), claims made by interviewees must be taken with caution. However, even if individuals are not engaging in the behaviors they discuss as much as they claim to, the behavioral statements still provide insight into behavioral knowledge and norms, two important determinants of behavior (Stern et al. 1999). At the very least, interviewees expressed interest in living in a life with minimal environmental impact, and

this desire could provide a baseline on which to design education programming. In terms of LAIE content, interviewees appear to be primed for more information on how they can help.

My data suggest that norms also help elucidate the cognitive process in which people decide whether or not they are a good environmentalist. The fact that almost everyone I interviewed saw themselves as “pretty good” regarding pro-environmental behaviors regardless of their actual behavior demonstrates the importance of norms in setting one’s behavioral expectations. Norms contain both a psychological and a social process; in the former, the individual internally establishes norms partly to ensure he/she is not too deviant from the correct behavior, and in the latter, the behaviors and attitudes in one’s community shape how one defines an environmentalist (Turaga et al. 2010). In my sample, those who engaged in advanced types of pro-environmental behavior (like leaving their air conditioning off all summer) saw themselves as similarly good about environmental behavior as those who only recycle. Drawing from research in social marketing in which norms proved to be a powerful determinant of behaviors (Goldstein, Cialdini and Griskevicius 2008), educators at all three sites could consider how to better activate participant norms to encourage conservation behavior.

4.4.5. Contributions to theory

VBN is typically used to assess general environmental characteristics, but the metrics have also proved useful in an animal-themed context. High correlations between the VBN metrics suggest that they are capturing similar constructs within the learner. Further, applying VBN to visitors in an animal-related facilitates exploration of how animal welfare attitudes relate to environmental attitudes. While activists in the animal welfare movement and the environmentalist movement have had some historical conflict (Callicott 1988), my study did not uncover a conflict between the two. The high levels of correlation between the AAS and NEP

combined with my interview data on how people view animals and the environment suggest that animal welfare and environmental concerns are heavily intertwined in learner populations. While this result is not entirely surprising, it does suggest that a less activism-oriented population is receptive to messages in which animal welfare and environmental messages are combined under the umbrella of the expansion of moral circles.

Significant life experiences theory suggests that spending time on environmentally focused activities as a child leads to an “environmentally active adulthood” (Chawla 1999). My interviewees’ significant life experiences are highly similar to the ones cited by environmental professionals (Chawla 1998b). However, while my interview sample may be highly interested in environmental topics, their commitment to action is lower than what might be seen in environmental professionals or activists. This suggests that an expansion of the SLE terms might be helpful; perhaps a more accurate statement would be that formative experiences with nature help the individual develop environmental values, beliefs, and norms, but that other factors might be responsible for the decision to take up activism. This altered SLE construct is supported by recent research on children suggesting that the early life experiences might not be as predictive of environmental values and knowledge as previously thought (Stevenson et al. 2014). My interviewees identify experiences and beliefs that are congruous with environmental professionals, but for some reason, the barriers they perceive (both logistical and motivational) are sufficiently high so as to prevent them from taking further actions for the environment. As an LAIE audience, these general environmental enthusiasts are receptive to new environmental behaviors, so using LAIEs to help lower or remove barriers to engagement should be a critical focus to future quasi-experimental research. By developing educational strategies to promote action, environmental educators can help counter the argument that “preaching to the choir” has

little value (Saylan and Blumstein 2011). Chapter 3 results suggest that all three sites have more potential opportunities to build action competence than they are currently utilizing.

It is important to note that while preaching to the choir is important, all three sites struggle to bring in nontraditional EE audiences. Learners at all three sites are more wealthy, educated, and white than the US population, and so figuring out how to appeal to a wider demographic is a challenge that persists in these sites. While educating conservation-literate populations is a more efficient way to meet learning goals, this practice does not help convince other audiences the value of conservation (Brewer 2001). Animals appear to be key in diversifying audiences, but perhaps more effort is needed to put the animals in front of audiences beyond the walls of the traditional institutions that educate about them (Nadkarni 2004).

4.5. Conclusion

Learners at all three sites have relatively high environmental awareness and are primed to receive more messages about environmental values, beliefs, and norms. Even though political orientation was predictive of environmental VBN in the expected ways, my interview data suggest that even conservative learners appreciate the value of animals and the importance of good animal care, so emphasizing the importance of the animals and ways to help them can serve to activate pre-existing environmental values, beliefs, and norms across the political spectrum. My research supports the idea that animal-themed educational facilities can provide an interesting and supportive environment to deliver environmentally themed messaging to audiences of diverse political backgrounds. I also find that specialty organizations in particular are capturing audiences that may be opting out of more traditional animal-themed programming, meaning that these organizations have a unique opportunity to deliver environmentally-themed messaging to these animal-sensitive populations.

Audiences also differed across the three sites in ways that aligned with the characteristics of each organization, suggesting that individuals might be self-selecting into organizational contexts that align with their pre-existing VBN. I recommend that more resources be invested into understanding the learner at all of these types of organizations, as my data demonstrates that learners across different types of animal-themed organizations are not monolithic. With a better understanding of their organization's unique audience, educators could consider being more aggressive with establishing behavioral norms that align with their audiences' incoming norms, perhaps leading to a higher likelihood that behavioral change could ensue. However, all three sites struggle to attract socio-economically/racially diverse audiences, and more energy could also be invested in reaching out to new audiences for a wider societal impact.

Both educational and SLE research would benefit enormously from increased longitudinal data collection efforts. Understanding how learner perspectives towards the environment, animals, and educational experiences shift over time will provide key insights into how programs at different types of animal-themed organizations impact the learner and help shift them towards a path of increased environmental action.

Zoo and aquarium education research represents a relatively disparate, diffuse field of inquiry (Ogden and Heimlich 2009). By bringing diverse types of animal-themed facilities into the conversation, I have entered a territory with even less cohesion in terms of both research and practice. More work is needed to characterize and evaluate the landscape of animal-themed education across different types of organization, as many learners are exposed to a variety of these types of experiences. Understanding how the same learners react to different facilities within a region could help educators design programs that build on similar environmental

themes, providing opportunities for learners to connect experiences from multiple facilities in meaningful ways.

CHAPTER 5: OUTCOMES

5.1. Chapter overview

This results chapter focuses on the learners' reactions to the program, answering the final research question in this work: How do learners internalize, interpret, and make meaning of LAIEs across different organizations, and how do post-LAIE behavioral intentions differ across sites? Sub-questions for this research question include: What key messages do visitors remember and take away from LAIEs? How do participants perceive their behavioral obligations post-program? In what ways do participants evoke the VBN pathways outlined in Chapter 3? Finally, how does the participant's interpretation of the program compare to the LAIE itself and the institutional/educator intentions?

This research question addresses the two key goals of conservation psychology: encouraging individuals to care for and act on behalf of the environment (Saunders 2003). The LAIEs offered at each site establish pathways through values, beliefs, norms, and behaviors (Chapter 3), and the visitors already cared for and acted on behalf of the environment prior to the LAIE to a considerable degree (Chapter 4). This chapter looks at the ways in which learners interpreted and internalized their LAIE by exploring what messages learners retained and how learners make meaning from these messages for their own lives. By using both interview and survey data, I can better understand the nuances and distribution of learner responses. Further, by incorporating the results from my previous two results chapters in the discussion of learner outcomes, I link intention to program delivery and subsequent reactions. Making these connections can help

educational facilities better understand how their programs impact learners and help them meet their own institutional goals.

The analysis in this chapter focuses on two sources of data. First, I present the post-program survey results. Second, I analyze sections of the learner interviews in which learners discussed their reactions to, and interpretations of, the LAIEs they experienced.

5.2. Survey Results

5.2.1. Behavioral intention metric

Learners had high post-program behavioral intention scores at all three sites (Table 5.1). The overall mean of all participants was 4.05 at NCA, 3.97 at CTR, and 3.92 at DLC, meaning that participants on average were “somewhat likely” to engage in the behaviors listed on the survey. However, as intentions post-program tend to be higher than behavioral follow-through (Webb and Sheeran 2006), behavioral intention data is more useful as a comparative tool than it is a predictor of behavior.

Table 5.1. Means and standard deviations for the behavioral intentions scores. All scores are based on a 5-point Likert scale, with a minimum of 1 and a maximum of 5.

	CTR		DLC		NCA	
Behavioral intention questions	mean	sd	mean	sd	mean	sd
Support this org \$	3.53	0.968	3.27	0.91	3.79	1.03
Get more info on helping in wild	3.6	1.07	3.23	1.1	3.76	1.23
Explore volunteering at this org	2.6	1.23	2.41	1.25	2.73	1.39
Encourage others to visit	4.74	0.72	4.77	0.65	4.71	0.72
Return for another program	4.02	1.12	4.01	0.99	4.25	1.28
Find out how to get as pet (reversed)	4.75	0.74	4.85	0.57	4.28	1.19
Seek similar facilities to visit	3.96	0.83	3.99	1.02	4.34	0.91
Look for new ways to reduce impact	3.89	0.99	3.91	0.92	4.18	0.81
Encourage others to protect env.	3.85	0.92	3.92	0.88	4.01	0.99
Sign petition to protect these animals	4.23	0.95	4.21	0.87	4.05	1.01
Share information from tour with others	4.46	0.81	4.56	0.66	4.5	0.69
Mean behavioral intention scores	3.97	0.54	3.92	0.46	4.05	0.6

I report the 11 behavioral intentions as both a single metric (Cronbach's $\alpha=.79$) and by each individual question. I maintain this level of detail because some behaviors involve supporting the organization, other behaviors ask about helping the environment/wild animals, and others are independent from those two categories. I used ordered logistic regression to model the individual behaviors post-program as a function of site and VBN variables while again controlling for demographics (Table 5.2). In an ordered logistic regression, a one unit increase in an independent variable results in an increase in the log odds of moving up to the next category that is equal to the coefficient, given all of the other variables in the model are held constant (Long and Freese 2006). So for example, for a one unit increase in gender (moving from male to female), we would expect a 0.567 increase in the log odds of selecting a higher Likert category for the behavioral intention of sharing information with others. Gender, political orientation, and environmental work/volunteering had little significant predictive value (women were more likely to share information they learned on the program than men), whereas age predicted a significant amount of the variance for several variables: older respondents were less likely to engage in four of the 11 behaviors.

The AAS predicted a significant amount of variance of two of the environmentally focused behaviors. Higher NEP scores predicted a higher likelihood to sign a petition, return for another program, and not look into obtaining a pet. Perceptions of local and global environmental problems had little explanatory power; individuals who perceived global environmental problems as more severe were more likely to intend to encourage others to protect the environment. A sense of personal responsibility on the other hand, was highly predictive of the variance of the mean behavioral scores; those with a higher sense of personal responsibility were more likely to intend to engage in all three of the environmentally focused behaviors and

were more likely to intend to share information from the tour with others. Biospheric values explained a significant amount of five of the 11 behavioral metrics.

The site variable was highly predictive of differences in behavioral intentions across sites. I ran the model with NCA as the reference group because its scores were the least similar to the scores at the other two sites. NCA participants are most likely to support the organization financially, followed by CTR and DLC (NCA participants were significantly more likely than DLC visitors at the $p < .01$ level and more likely than CTR visitors at the $p < .1$ level). DLC respondents are less likely than NCA respondents to seek information on helping these animals in the wild. NCA respondents are significantly more likely to look for new ways to reduce impact than both CTR and DLC respondents, significantly more likely to seek out one of these animals as a pet, and seek similar facilities than both CTR and DLC respondents.

I also created a mean behavioral intentions score for each individual based on their responses to the 11 Likert questions and used multiple linear regression to model behavioral intentions mean scores with the same demographic and VBN variables as independent variables (Table 5.3). AAS, personal responsibility, and biospheric values predicted a significant amount of the variance of the mean behavioral scores, whereas perceptions of the severity of local and global environmental problems, egotistic values, and altruistic values did not. Older respondents had slightly lower behavioral intention scores, and individuals working or volunteering in the environmental sector had higher behavioral intention scores. Overall, NCA learners' mean behavioral scores are significantly higher than DLC scores, but not statistically different from CTR. However, NCA participant scores are significantly higher than CTR's at the $p < .1$ level, indicating a weak predictive relationship between those as well.

Table 5.2. Ordered logistic regression analysis with behavioral likelihood Likert scores as the dependent variables. **=P>.01 (yellow), * =p>.05 (orange), + =p>.1 (green). The first line for each independent variable displays the beta coefficient and the second line displays the standard error.

Behavior type:	Organization-specific				Environmental			Other			
Independent variables:	support this org \$	explore volunteering	encourage others to visit	return for another program	get more info on helping in wild	look for new ways to reduce impact	encourage others to protect env	sign petition	seek similar facilities	find out how to get as pet (reversed)	share information
Site differences											
CTR (NCA ref)	-.432+	-.250	.654+	-.728**	-.515*	-.711**	-.430	.229	-1.10**	1.36**	-.176
	[.268]	[.245]	[.361]	[.271]	[.260]	[.268]	[.267]	[.268]	[.266]	[.360]	[.291]
DLC (NCA ref)	-1.07**	-.379	.536	-.874**	-1.145**	-.816**	-.346	.153	-.672*	2.05**	-.095
	[.277]	[.248]	[.359]	[.268]	[.262]	[.265]	[.263]	[.265]	[.266]	[.424]	[.293]
VBN variables											
AAS	-0.037	.097	-.275	.133	.334	.504*	.713**	.563	-.014	.199	.110
	[.238]	[.248]	[.326]	[.233]	[.231]	[.235]	[.236]	[.240]	[.235]	[.334]	[.258]
NEP	-0.24	-.371	-.557	-.727**	-.487+	.305	.429	.680**	-.191	.726*	.217
	[.268]	[.239]	[.364]	[.267]	[.255]	[.267]	[.270]	[.265]	[.263]	[.359]	[.291]
Global problems	0.125	.078	.113	.072	.375	-.462+	-.840**	.027	.128	-.217	.143
	[.277]	[.251]	[.368]	[.267]	[.257]	[.276]	[.283]	[.276]	[.273]	[.359]	[.292]
Local problems	0.143	-.044	.145	.158	-.072	.245	.300	.163	.266	-.262	-.079
	[.199]	[.187]	[.273]	[.194]	[.189]	[.203]	[.201]	[.204]	[.195]	[.278]	[.219]
Personal responsibility	0.188	.249+	.078	.216	.297*	.333*	.431**	.228	.227	.070	.508**
	[.157]	[.144]	[.214]	[.151]	[.151]	[.162]	[.159]	[.156]	[.153]	[.213]	[.172]
Egotistic	0.008	-.075	-.078	-.147	.007	-.177+	-.019	.046	.059	-.071	.013
	[.092]	[.086]	[.130]	[.096]	[.091]	[.097]	[.098]	[.098]	[.092]	[.135]	[.107]
Altruistic	-0.251	-.210	.122	-.049	-.361+	-.077	-.130	.104	.049	.315	.213
	[.195]	[.189]	[.274]	[.196]	[.192]	[.204]	[.208]	[.203]	[.199]	[.276]	[.218]
Biospheric	0.152+	.149+	.240+	.049	.434**	.579**	.735**	.289**	.115	-.038	.288**
	[.092]	[.086]	[.127]	[.094]	[.091]	[.099]	[.100]	[.094]	[.090]	[.126]	[.102]
Demographics											
Women (men ref)	0.136	-.280	.596+	.102	-.017	.209	-.015	.081	.200	.432	.567*
	[.226]	[.210]	[.312]	[.221]	[.217]	[.226]	[.228]	[.230]	[.226]	[.322]	[.248]

Behavior type:	Organization-specific				Environmental			Other			
	support this org \$	explore volunteering	encourage others to visit	return for another program	get more info on helping in wild	look for new ways to reduce impact	encourage others to protect env	sign petition	seek similar facilities	find out how to get as pet (reversed)	share information
Independent variables:	0.011	-.027**	-.001	.003	-.021**	-.009	-.013+	.008	-.020**	.034**	-.007
	[.008]	[.007]	[.010]	[.007]	[.007]	[.007]	[.008]	[.008]	[.007]	[.011]	[.008]
Repubs (Dem ref)	0.519	.519+	-.184	-.325	-.198	-.465	-.298	-.265	-.256	-.697+	-.294
	[.310]	[.284]	[.426]	[.303]	[.301]	[.306]	[.309]	[.306]	[.306]	[.417]	[.331]
Env. work/vol	0.23	.489+	.222	.052	.443+	.146	.483+	.169	.296	.189	.384
	[0.271]	[.251]	[.398]	[.264]	[.263]	[.273]	[.282]	[.288]	[.270]	[.385]	[.315]
Number of obs	323	359	358	356	357	358	357	357	355	356	358
Pseudo R-squared	0.05	0.0372	0.032	0.032	0.089	0.147	0.175	0.119	0.055	0.135	0.098
**=<.01	*=<.05	+=<.1									

Table 5.3. Linear regression model with mean behavioral outcome scores as the dependent variable. The first line for each independent variable displays the beta coefficient and the second line displays the standard error.

	Dependent variable:
	Mean behavioral score
Independent variables:	
Site variables	
CTR (NCA ref)	-0.122+
	[0.07]
DLC (NCA ref)	-0.154*
	[0.07]
VBN variables	
AAS	0.142*
	[0.06]
NEP	-0.018
	[0.07]
Global problems	0.001
	[0.07]
Local problems	-0.016
	[0.05]
Personal responsibility	0.118**
	[0.04]
Egotistic	-0.033
	[0.02]
Altruistic	0.005
	[0.05]
Biospheric	0.092**
	[0.02]
Demographics	
Women (men ref)	-0.011
	[0.06]
Age	-0.004*
	[0.00]
Repubs (Dem ref)	-0.062
	[0.08]
Env. work/vol	0.154*
	[.007]
Number of obs	327
Pseudo R-squared	0.212
**=<.01	*=<.05
	+=<.1

5.2.2. Free responses

The first free-response question on the post-program survey asked visitors to write down the three most important things they learned on the program. From these answers, I created emergent categories, coding each person's three important things separately. At CTR I collected 186 post surveys with 464 total statements (2.5 average per survey), at DLC I collected 165 post-surveys with 422 statements (2.6 average), and at NCA I received 161 post surveys with 358 free-responses (2.2 average). While I originally created 20 emergent codes, I grouped them into five themes (Table 5.4), making each theme more robust.

The first category of responses I called "animal facts." This theme consisted of two individual codes: animal facts and species diversity. There were no values judgments or normative statements in this theme, only fact-based statements like, "cougar being stronger than lions," "female dominance in most species," or "jelly fish anatomy." Animal facts provided by learners reflects the topics of the tours at each site, most notably the diets, behavior, and features of the species present at each facility. Unsurprisingly, DLC's visitors mentioned biological diversity far more frequently than visitors at the other two sites, reflecting the importance of species diversity in DLC messaging. Overall, 43% of all "important message" statements at DLC were about animal facts, 37% at NCA, and 31% at CTR were animal facts statements.

The second category includes all of the anthropocentric codes: egocentrism, anthropocentrism, value of animals for humans, and education. In this cluster, learners emphasize human needs, values, or perspective in their answer. For example, I coded "Tigers are super cute" as egocentric because the individual is highlighting the importance of their ability to see it and determine its cuteness. Approximately 6.5 to 7% of learner responses fell into this human-centric category across all three sites. However, the flavor of the anthropocentrism varies

across locations. At DLC, the majority of responses in this category referenced lemur value as a research subject, specifically in studies benefiting humans (e.g. Alzheimer's research).

Table 5.4. Coded responses to the open question, "What are the three most important things you learned during your tour?"

	CTR		DLC		NCA	
Code description	count	%	count	%	count	%
ANIMAL FACTS						
Facts (biology, natural history, ecology)	132	28.4%	129	30.6%	123	34.4%
Species diversity	11	2.4%	53	12.6%	11	3.1%
TOTAL SECTION	143	30.8%	182	43.1%	134	37.4%
ANTHROPOCENTRIC						
Egocentric	15	3.2%	10	2.4%	9	2.5%
Anthropocentric	12	2.6%	3	0.7%	10	2.8%
Animal's value to humans	0	0.0%	16	3.8%	0	0.0%
Education	3	0.6%	0	0.0%	5	1.4%
TOTAL SECTION	30	6.5%	29	6.9%	24	6.7%
WILD ANIMALS/ENVIRONMENT						
Threats to animals in wild	20	4.3%	77	18.2%	35	9.8%
General environmental threats	0	0.0%	8	1.9%	3	0.8%
General environmental statements	0	0.0%	13	3.1%	1	0.3%
Normative statements - conservation	11	2.4%	10	2.4%	9	2.5%
Animal's ecological significance	12	2.6%	17	4.0%	0	0.0%
General conservation	3	0.6%	4	0.9%	7	2.0%
TOTAL SECTION	46	9.9%	129	30.6%	55	15.4%
CAPTIVE/INDIVIDUAL ANIMALS						
Animal care (this facility)	20	4.3%	16	3.8%	68	19.0%
Threats to animals in captivity	92	19.8%	10	2.4%	2	0.6%
Normative statements - animal welfare	78	16.8%	11	2.6%	5	1.4%
Individuals/populations at this center	12	2.6%	3	0.7%	1	0.3%
TOTAL SECTION	202	43.5%	40	9.5%	76	21.2%
OTHER						
Ways we can help (specific or general)	16	3.4%	2	0.5%	36	10.1%
This organization's work	27	5.8%	40	9.5%	33	9.2%
TOTAL SECTION	43	9.3%	42	10.0%	69	19.3%
	464	100.0%	422	100.0%	358	100.0%

At CTR, the majority of the responses in this category focused on the visitor's pleasure in seeing the animal (because it was cute, amazing, etc.). NCA's responses in this category were the most diverse (see Appendix G for detailed responses).

The third category includes all of the general "environmental" concepts. This grouping includes statements about conservation in the wild and general environmental value, ecological significance, normative statements about conservation ("should" and "need" statements), etc. This category has the largest number of separate codes; while I considered separating out environmental statements from animal-centric statements, this proved to be quite difficult because concepts like habitat and ecological significance simultaneously refer to both the animal and the environment. Thirty-one percent of DLC visitors' statements fell in this category, vs. 15% at NCA and 10% at CTR. Within the category, visitors at all three sites mentioned "threats to animals in wild" most frequently, but interestingly, no CTR visitors made any general environmental statements, and no visitors at NCA made any reference to an animal's ecological significance.

The fourth category includes information specific to animals in captivity. This includes animal care at this facility, threats to animals in captivity, normative statements, and information about animals at each center. CTR visitors made statements in this category far more frequently than visitors at the other two sites, with 43.5% coded into this group, whereas only 21% of statements at NCA fell into this category, and 9.5% at DLC. Also, almost all of NCA's answers in this category described animal care at the facility itself (as opposed to normative statements about captivity or welfare). In fact, while 37% of the statements from CTR are either about threats to animals in captivity or norms about treatment of animals in captivity, those two categories combined represent just 2% of statements for NCA, and only 5% at DLC.

The final category is named “other,” and it includes two codes that deserve separate consideration. First, “this organization’s work” is different from the “animal care” code because the statements in this code refer more generally to the work of the facility. While statements in this category might refer to conservation, rescue, education, etc., I grouped them together because this category represents more of a reiteration of mission than anything else. Many of the statements in this code do not specify which aspect of the organization’s work is important, simply saying that the work of the facility (whatever work that might be) is very valuable. CTR got the fewest responses in this category, with 5.8% of the statements; this is lower than both NCA and DLC, where respondents mentioned the facility 9.2 and 9.5% of the time, respectively.

The second code in the “other” category is “ways we can help.” I lumped both specific behavioral statements (such as, “don’t leave trash on the beach”) in with general statements (like, “how I can help”) because the latter is effectively shorthand for the former, and all categories had both specific and general statements combined; this decision thus represents consistent treatment. NCA responses fell into this category most frequently, with over 10% of the responses referring to ways individuals can help; CTR only had 3.4% in this category, and DLC only had two responses, totaling 0.5%.

The next question on the post-program survey asked, “Do you think it’s important for this facility to exist? Why or why not?” All respondents said yes to the first part of this question, so I only coded the “why” part (Table 5.5). I allowed up to two codes per individual; out of 512 post surveys, 444 respondents answered this question, and out of those 444, 150 needed two codes, whereas only 15 would have benefitted from three codes. In those 15 cases, I coded the first two items mentioned by the respondent.

Table 5.5. Codes and examples for question, “Do you think it’s important for this facility to exist? Why or why not?”

Code	Example
Rescue/animal care	To give the animals a better life; these animals would be left in horrible condition
Education	Education and exposure; provides a learning opportunity for the public
Conservation/preservation	It helps to protect endangered species; to continue the species; to protect animals
Research	They need to be preserved and studied; one of few places that study this endangered species
Other	Absolutely: for all the reasons explained on tour; You can enjoy species you would NEVER see

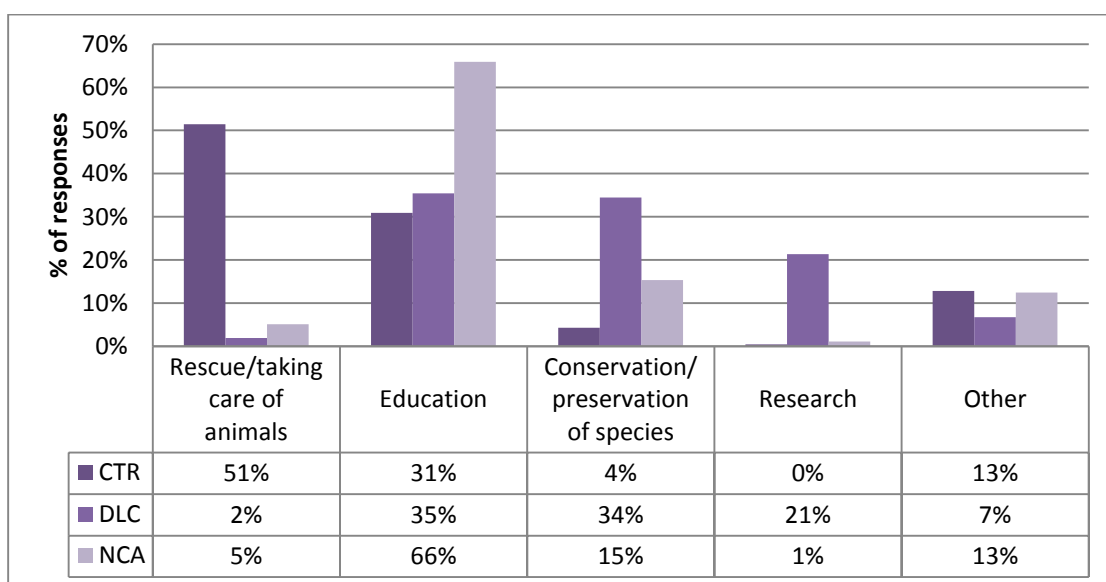


Figure 5.1. Coded free responses to the question, “Do you think it’s important for this facility to exist? Why or why not?”

Survey responses tracked very closely with the missions of each organization (Figure 5.1). Fifty-one percent of CTR’s responses referred to its role in rescuing/caring for animals, compared to 2% of responses at DLC and 5% at NCA. Many participants mentioned the educational value of the organization, with 66% of NCA responses falling into this category, 35% at DLC, and 31% at CTR. At DLC, 34% of the responses focused on DLC’s role in conservation/preservation of species, but only 15% of the responses at NCA and 4% at CTR fell in this category. Research was stated in 21% of the responses at DLC, and essentially never in

other places. The “other” category includes several codes, none of which individually totaled more than 6% at any one site. This category included entertainment reasons (so we can go see them), behavioral change reasons (to get us to change), and general statements about the organization’s important work (see Table 5.5 for examples).

Finally, the post-program survey asked the question, “Do you think it is important to conserve these animals in the wild? Why or why not?” Again, almost all respondents said yes; 15 individuals had mixed feelings about wild animal conservation, and these responses are in the “other” category. Some of the categories appear redundant, but the redundancies represent different understandings of this question (Table 5.6). The first three codes (anthropocentric, biocentric, and ecological) represent instances in which participants answered the “why” question with a “because” response (Figure 5.2). In these categories, learners either remarked that animals needed to be conserved because they are valuable to humans, because they have their own inherent right to life, or they serve a valuable ecological function. In these categories, NCA respondents had the most anthropocentric and least biocentric/ecological responses out of the three sites, whereas CTR and DLC respondents answered very similarly across these three categories (CTR had only slightly more responses fall in the biospheric category than DLC).

The next two codes, “need to preserve” and “we need to help” were used when visitors did not respond to the “why” question with a “because” statement, choosing instead to restate the question in some form. So I coded a response “it’s important to preserve these animals” when the person stated the value of preserving the animal, and I coded a response as “we need to help conserving these animals,” when the learner assigned human responsibility to the task (see Table 5.6 for examples). DLC and NCA respondents more frequently stated a need to preserve these

animals than CTR respondents did, but NCA visitors more frequently mentioned our own obligation to help than visitors at CTR or DLC did.

Table 5.6. Codes and examples for question, “Do you think it is important to conserve these animals in the wild? Why or why not?”

Code	Example
Anthropocentric	We may learn something to help lemurs; for generations to enjoy; if earth can't support wild animals, long term can't support us either
Biocentric (rights based)	All species have right to life and flourish; natural habitat; because that's where they should be; As it is for all animals
Ecological reasons	They play a key role in the environment; Ecosystems should remained balanced
Need to preserve	When they are gone they can't be replaced; so they won't become extinct
We need to help	We should try and reintroduce when possible to native habitat; we all need to co-exist
Mixed feelings	Not if possible but some will not survive if returned to wild; not sure - evolution has seen species come and go long before we were here, Man is another "predator"
Other	Future; extremely; as much as possible

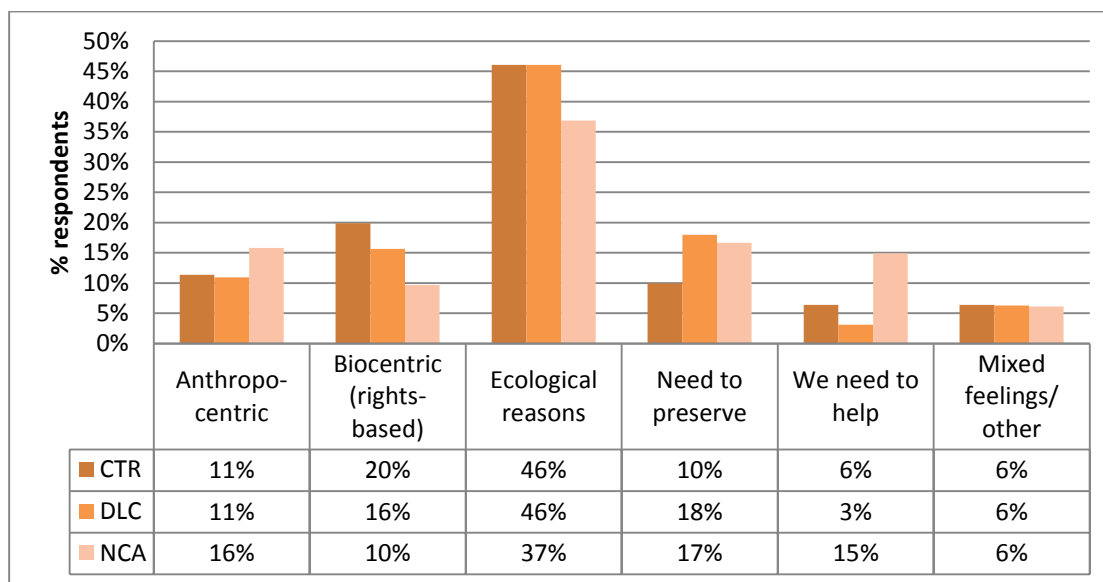


Figure 5.2. Coded free responses to the question, “Do you think it is important to conserve these animals in the wild? Why or why not?”

5.3. Interview data

While the survey data is useful for comparing behavioral intentions and message retention, learner interviews are most useful to help understand how the visitors relate the

messages they hear to their core values and beliefs. I asked interviewees to elaborate on their memories, reactions, and interpretations of the LAIE they experienced.

Before I delve into the interview results, I want to explain the process of eliciting VBN-themed responses. While there were a variety of topics that could elicit values, the way I found easiest to get participants to think along VBN lines was to ask a lot of “why” follow-up questions. So I would ask about the value of the tour, the important messages on the tour, and then I would ask why that was important, as in the following exchange:

“S: What is the value of their work?”

Int: I would say that it's... Since it's no longer a breeding facility, that it's sort of taking care of animals that can't be cared for by their original owners. And so trying to make the best of what started out as a crappy situation.

S: And why would you say that's important to do?

Int: I think that it's important to treat animals with respect. I'm predominantly a nature photographer, and although I don't see big cats in the wild, but it's just important to sort of, with the... the philosophy I use for hiking is leave no trace, so trying to enjoy what nature has to offer but without having a negative impact, and so here is a case where they're trying to minimize the negative impact that other people have caused.”(CTR learner 63)

While the interviewee first focuses on the physical work of the organization, the second part of the quote delves more into values and beliefs; the participant evokes biospheric values as well as a belief in the inappropriateness of human dominion. I show this quote at the beginning of this section to establish the fact that while I minimize my own presence in the quotes in the interest of brevity, many of the quotes were prompted by “why” questions of this type.

5.3.1. Important messages

I asked interviewees to recall important messages from the LAIE. This data corresponds with the first open response question on the survey. Much like the survey responses, interviewees honed in on the core concepts covered at each place, highlighting concepts that are tightly linked

with the mission at each site as well as the specialized VBN pathways outlined in Chapter 3: individual welfare at CTR, species conservation at DLC, and general aquatic environments at NCA. In this section, I outline interview responses by site and then report responses to my “sound bite” question.

Carolina Tiger Rescue

At CTR, the VBN pathway framing the value of the animal as an individual was evoked by every interviewee in some form. Participants articulated one or more of the following concepts to evoke the specialized VBN pathway: animal’s value as an individual, the issues tigers face in captivity (adverse consequences), judgment towards those who do keep animals privately (activating norms), and gratitude for places like CTR that can help deal with this problem (ascribing responsibility to CTR). The following quotes best express aspects of this VBN pathway:

“I was appalled at what people had done to cats. Like the cats that have been declawed and...the conditions they’ve been kept in. Whether declawed or not, the tigers...just the number of big cats that are in private hands outside of zoos. You ask yourself what these people are thinking about. It’s only one thing, is making a buck. Can’t make a lot of money, I wouldn’t think, off a tiger.” (CTR learner 554)

“Yeah, it makes me question the sanity of those who buy the animals in the first place, and how much these people must be paying to buy these animals in the first place, and where are they getting them? And that doesn’t make me want them [as pets] any more, but it makes me a little angrier at the people that do have them.” (CTR learner 58)

“The other thing was the fact that so many people have these animals as pets, and then just abandon them, and you know some of the ones they had there were declawed, or deformed, it just... makes you aware that that’s not very good, and the fact that the Tiger rescue is a place that helps take these cats, was great.” (CTR learner 69)

“Some of those stories about where the animals were rescued from – when the Zanesville Ohio situation happened last year, that felt really sad, and sort of a terrible tragedy, that someone who would profess to love animals would do something so counterproductive. And so hearing that there are places like the Carolina Tiger Rescue that offer a better option and will help the animals was really nice.” (CTR learner 63)

Identifying CTR as a place where people help with the problem also serves two purposes: it ascribes responsibility to the organization, and it allows CTR to demonstrate care, a behavior they hope their visitors emulate through supporting the organization. These two visitors identified that caring component as a critical part of their positive experience:

“To show kids to that people care enough to take care of them. Not just euthanize them and put them down because their inconvenience, but that there are people out there that who want to go beyond the norm to take care of 'em.” (CTR learner 71)

“One of the things that I think made it feel a little bit different than the zoos, that I just got the sense that the folks who are keeping it were really driven by... the success that comes from keeping it operational. It seemed very directed towards the animals that were there, inwardly focused and sort of self-propelled. And I just think that the missions [of] different organizations are drastically different from a zoo, something that is...is only concerned with itself. But it leads that experience to be very different. You really feel like you're being presented with a lot of information, it's sort of like a flashier and showier and instructive way, at a zoo. And this was a lot more... I felt taken care of, and I felt like I was with knowledgeable people as you're going around the park. But you could also tell that you as visitors in the park, we were maybe like the sixth most important thing going on that day.” (CTR learner 68)

Duke Lemur Center

At DLC, participants recalled messages relating to all aspects of DLC's mission. DLC interviewees evoked concepts consistent with the value of lemurs as a species, the specialized pathway for DLC. The overarching concept is keeping the “population going” (a participant's words); activities under this umbrella include in-situ conservation work, maintaining the breeding population, scientific research, and education efforts to increase awareness of lemurs and their threats. Because of the diverse activities, participant answers meandered quite a bit, sometimes bringing in multiple aspects of DLC's mission at once:

“It seems like they're not doing so well in their natural habitat so firstly, to preserve the species. I mean, I think part of that preservation comes from what people are learning about them, the research that's done there that allows the biologists to know more about how to keep them happy and healthy. And I guess like general scientific inquiries, wanting to know more about this particular species and how they relate to other primates and to humans, and evolutionarily how they came about. I guess those kinds of things. And all that research hopefully will be able to increase their longevity and livelihood in their natural habitat.” (DLC learner 531)

“That they’re trying to keep the population going. I mean it sounds like in Madagascar there’s a huge threat and so that they’re doing this really important initiative for lemurs. And building awareness in general for people about lemurs and their environment. I think it’s really cool that in the middle of Durham there’s this key protection facility. It was interesting hearing about the different kinds of lemurs, what their lifestyles are about, you know, we got to enjoy hearing some of them make their loud noises, it’s amazing that such a little thing can make such big noises.” (DLC learner 194)

“And so being able to understand that they all have very different roles as one of the main large mammals on Madagascar as an island, they have all these different roles. And without one of them, everything else could fall apart. So the one that has the extra hair on his face and he went around and pollinated flowers and things like that - without that, you know we wouldn’t have it, so I think [the educator] really emphasized that they all have very different roles.” (DLC learner 140)

“I think it certainly was about, to me, the most important things were to preserve lemurs and sort of build the population back, either in Durham or in Madagascar, or both basically. And certainly I think bringing attention to what’s going on in their native Madagascar particularly, I think certainly will help people realize and understand what’s going on, and hopefully support the Lemur Center, and if that, if that’s the cause they really felt drawn to help out with.” (DLC learner 552)

“Well, since lemurs are sort of isolated to Madagascar, it helps expose people to an animal they might not see otherwise. It also gives them a place that’s – heaven forbid if something had happened there, where a lot of the population could be destroyed – you could have still a place where you might be able to help rebuild the population from.” (DLC learner 549)

A general narrative runs through these quotes: I have never heard of lemurs, now that I have heard about them they are interesting (valued object), they are threatened in Madagascar (awareness of consequences), and DLC helps by educating, keeping a population, doing work in Madagascar, and conducting scientific research (ascribing all responsibility to DLC).

While seeing the animal is the important point in this quote as well, the unfamiliarity with lemurs is what made it exciting – so both the newness of an animal and the anticipation of seeing something which was previously elusive, both of these things are cause for enjoyment.

“So I’m totally unfamiliar with lemurs, so from start to finish it was all really interesting to me, and new. Let’s see. I like the idea that some of them are allowed to be out on their own, out and enjoying.... I just I enjoyed it.” (DLC learner 194)

“I mean, actually getting to observe a different kind of wildlife that I really had no prior knowledge of. I mean I’ve heard of lemurs before, and I think I’ve [seen] a couple of pictures, but never actually seen any in person.” (DLC learner 552)

North Carolina Aquarium

While NCA delivers a variety of general environmentally themed messages, the behind the scenes tour focuses on animal care at the facility, so even though it includes a lot of information about the animals in the wild or general biological features, learners picked up on the animal care as the biggest message:

“I think sometimes people have an idea that when they look at an aquarium or zoo or whatever, they think about the mistreatment of the animals, how did they mistreat them to do with they wanted them to do, or what have you. And it seemed to me that there was a very high regard for the animals in their environment, and maybe enticing them with food, or something to do what they wanted them to do, I was thinking about the turtle that that she was talking about, the one sea turtle, and how they would place something there to get it to swim to where they wanted to get it, instead of picking it up and moving it, which would be a whole lot easier to do, to move it from one place to another, but to actually try to give that environmental feel to the animal, and let it still feel like it's in its environment.” (NCA learner 112)

“I think it’s really cool to see how much care goes into the organisms. You kind of think that once they’re there they’re there you just feed them and you’re good to go. I think it was really cool to see that no, they’re more delicate than that, they need intellectual stimulation, they need certain types of lighting, they need... there’s so much more care.” (NCA learner 155)

“I thought it was really neat to see... I like the diet. We don't realize what goes into creating those diets for those animals, they go in every morning and take it out of the freezer; it's almost like a school, you know? They have to go in in the mornings and prepare! Or a hospital! Each animal has its own diet; you have to make sure they get fed the right food, the right nutrients, that was really interesting.” (NCA learner 110)

“I think, probably how much effort goes into taking care of the animals, and taking care of them in a way that provides the closest to the natural experience for them.” (NCA learner 155)

“I think the main thing that she seemed to be doing with some exceptions were how the aquarium operated, how it kept the animals, and where the good nutrition, trying to duplicate what's in nature. And that's what she was trying to do. So not so much what the animals did, I mean, except trying to duplicate what the animal did normally, but you know, for the aquarium, but not so much talking about the background of the animal particularly.” (NCA learner 523)

This theme of general aquatic animal care does not explicitly evoke the VBN pathway of the animal as a local ecosystem, but NCA participants are also expressing their general surprise that aquatic animals require the amount of care that they are provided at NCA, a concept that fits in with the perception of the animals more of a resource and less of an individual.

“Sound bites”

The data on important messages in this section is taken from a question I posed to most of the Round 2 participants (all answers are presented in Table 5.7). I asked 15 people the question, “If you could sum up the value of your experience at CTR/DLC/NCA in one or two sentences, what would it be?” I did not ask all participants because I added this question after the fourth interview of Round 2 and because some interviews ended either too abruptly or tangentially to pose the question. I added this question because I wanted to hear the participant’s assessment of the LAIE’s impact *after* we had concluded our discussion on values, beliefs, and norms. The consistency of these sound bites, considering that it was an open question, is exceptional: The CTR quotes focus on the animals at CTR and CTR itself, the DLC quotes are about raising awareness about lemurs (a topic they knew little about before), and the NCA quotes all speak to the educational experience reinforcing broader values, ocean and coastal stewardship, and individual responsibility.

5.3.2. Making connections to the environment

As outlined in Chapter 1, one of the main goals of this study is to understand how LAIEs can help expand one’s moral circle to the larger environment. This expansion requires the learner to be able to see and/or make connections between the LAIE, the larger environment, and their own lives in order to identify themselves as an agent of positive environmental change. Thus, I asked interview questions exploring areas of connection between the concrete people/animals

and the more abstract environmental principles that might be evoked in each context. I identified three main concepts learners used to join these animals and experiences to bigger concepts: environmental beliefs, education, and concrete connections.

Table 5.7. Short summaries of the impact of the LAIE on the interviewee

CTR	DLC	NCA
<i>How totally beautiful the animals were, and how much I appreciate the care they're being given. (CTR 553)</i>	<i>It's raised awareness of lemurs in general, it's raised awareness of the importance of what the Lemur Center is doing to maintain the population. (DLC 194)</i>	<i>It made me more aware, it made me smarter. And it reinforced what I kind of already believed, so it helped to reinforce my values around the topic. (NCA 520)</i>
<i>I would never try to own a big cat like that. (CTR 532)</i>	<i>I've never seen a lemur before. So seeing lemurs was impactful in gaining appreciation for what they are and where they live and what they do and what the Lemur Center does was nice. (DLC 531)</i>	<i>I think that this tour reinforced my interest and already formed notions in the importance of ocean stewardship. (NCA 155)</i>
<i>That it reiterated that animals need to be in a certain place, and it's good that there's somebody, or some people that can help those who are less fortunate. (CTR 550)</i>	<i>That it's a great experience for people who have never either seen or just don't know a lot about lemurs, to see a different type of primate. And a part of the world that's really foreign to most of us. (DLC 145)</i>	<i>The tour rekindled my enthusiasm for the coastal life of North Carolina and gave me a lot to think about and look forward to. (NCA 184)</i>
<i>It reinforced that the Tiger Rescue appears to be a worthwhile organization and seems to be run well. (CTR 571)</i>	<i>I guess it raised awareness. I guess that's maybe two good words for it. Like I said, I didn't really know anything about lemurs before I went there. (DLC 552)</i>	<i>It's a fun and easy way to educate people. I mean, you're going in there just to look at the animals but you're gonna come out with a different understanding of how you as an individual will impact them, or can. (NCA 518)</i>
<i>The up close and personal education that I experience when visiting these places. (CTR 541)</i>	<i>(only four DLC responses)</i>	<i>That it was very educational for people to go behind the scenes. (NCA 523)</i>

Environmental beliefs as a bridge

I asked some participants whether they see a relationship between the animals/local organization and wider conservation/environment, and interviewees provided mixed responses.

For those who were able to see connections, some interviewees brought in general environmental beliefs that map well onto the NEP dimensions (Dunlap et al. 2000). In the upcoming quotes, I have bolded passages that indicate the interviewees could not remember these messages being spelled out on tour; they came as a personal *interpretation* of the tour.

First, in order to connect these animals to the larger environment, the belief in the inappropriateness of human dominion over nature was evoked:

*“Yeah I don’t know **how much of that came across in the tour**, but you see quite a bit out there that they’re an important part of the ecosystem. The ecosystem worked fine for millions of years until man came along and started really screwing things up. And one of the things we need to be careful about is, may not be that specific sea turtle, or that species of sea turtle, but if you detrimentally impact enough species of enough things on the planet, it will ultimately give back impacting to the human race, and probably not for the good.” (NCA learner 120)*

*“I think that the connection to be drawn, **and it might have been something you had to draw yourself**, was that this is kind of like a microcosm of what we're doing with everything in a way, in terms of the environment. We consume for our own pleasure, and then when we're ready to let it go and say it's either too much of a burden or it's gotten to be out of control, I can't take care of it, I can't deal with the conditions that I have created, then you just literally leave it on someone else's doorstep. As many of the cats were in the middle of the night. And I think that's kind of a lot of people's attitude towards the environment today, that it's not necessarily our problem, and if we can continue the behavior we've already established for however long, it's someone else's problem, so you can leave it on someone's doorstep when you're done with it. So I did draw that connection, **I'm not sure it was necessarily spelled out though**.” (CTR learner 58)*

“I guess it’s the movie beforehand and all that, we need to protect their environment so it’s good that you guys are there and helping them to realize that if they keep on cutting down their forest, that the lemurs will no place. So, that sort of reinforced the fact that yeah, while growth is good, conservation is also an equal part of it that needs to be taken into consideration. You can’t grow at the expense of the environment.” (DLC learner 549)

This dimension also tracks closely with the idea of ecological limits to growth, which is most strongly evoked in the last quote.

Belief in the fragility/interconnectedness of nature’s balance was also used by some participants to make connections:

*“Well sure, there- that has to be [a connection]. Because unless you protect the cats’ environments, there won't be the cats. **And that message was at different times at different***

levels verbalized. *You know, their habitats are gone, or their habitats are shrunk, or... Comments generally like that. That sends the message that there's an underlying environmental issue.” (CTR learner 41)*

This interviewee also evokes the “everything is connected” belief in making the bridge between our behaviors here and abroad:

“I mean I'm sure that some of the things that we do, like I try to... just teaching my children and trying to teach other people's children that I do come in contact with the importance of saving trees and not cutting down rainforests, things like that would maybe come in to play a little bit with where the lemurs live? I even think just recycling and not trashing of the earth in general helps us to be able to keep natural habitats clean and preserve them as they are.” (DLC learner 43)

I asked this learner about the connections between animal welfare and environmental issues, and they acknowledge that there is a connection, but that the connection feels like more of an abstraction than a felt reality:

“I guess when I think about environmental issues, I'm thinking more about like trees, earth, water, plants, you know, oxygen, whatever those are. And then when I think about animal rights issues, that's something else. But I know that there is a balance there. Like it's all part of an ecosystem where, you know, we all interact with each other and, you know, that allows the environment as whole to be healthy. So yeah, I definitely agree that there's a relationship. I don't, yeah, I don't always think about those issues as going hand in hand. But I realize that there is a relationship.” (DLC learner 531)

In the NCA context, not only is everything connected, but the local aspect adds richness to the experience of that connectivity:

“Watching something on TV, you can separate yourself from it because that's far away, and other people have nothing to do with me. I mean when you visit somewhere like this you see that it does impact you. Especially how they have it set up. There are mountain regions, and we were pointing out to the girls, these are the fish that we would see at home, and this is what it's like at home. And it is a part of us and so you do come to realize that you do interact with these species and you do have an effect; dumping stuff in the water, polluting the water. It does have an impact. The turtle that she showed us yesterday where someone kept it as a pet and it had the wrong nutrition and so it didn't form right. They got to see that their choices towards another species you know, it does have an impact.” (NCA learner 518)

In sum, visitors did not see much articulation of these general environmental beliefs on tour, but when prompted, learners made connections that were evocative of several of the dimensions of the NEP.

Education as a bridge

The other way I saw participants make connections between these animals and the larger environment was through education:

“I guess I don't really know what kind of connection they have to the ones of the wild, since the ones that are there are basically not used for breeding so nothing is reintroduced into the wild. I feel more that they're a sanctuary for the animals that have been neglected, abandoned or abused. I guess their connection to the ones in the wild is education. Educating people, to get some information and to get up close and personal with these animals so they can relate, when they hear about a species becoming endangered or poaching, hunting, the black market, so that way they can relate what they've seen and what they've learned, and hopefully act upon it through laws and legislation. And teach their children, too, about conservation of nature, and the animals that are our responsibility to provide for.” (CTR learner 71)

Even though NCA does engage in some in-situ conservation work, interviewees still identified their educational efforts as the most important link with larger conservation efforts, citing increased awareness as a key component of successful environmental conservation.

“[S: how would you characterize the relationship between what the Aquarium does helping the animals they help, and general environmental conservation?] Awareness, definitely. Which I think is huge, the more you can make people aware.” (NCA learner 520)

“Oh, I think [NCA] can have a big impact, yeah. Because, as I said, people who never have anything to do with the out of doors really do like the aquarium. They love to go there. They love to see the animals. They love to. And if it can't do anything, it helps their awareness. When they see those turtles I see, I mean all those people who were looking at the turtles, “Oh, you know, the turtles are so cute and so pretty.” And they have to feel, “Oh, we got to save this animal.” I mean I just feel like they must. So I think it has a big impact, yeah. I think really those are good institutions.” (NCA learner 523)

These interviewees not only discuss education, but also all of the benefits they see stemming from educational efforts, including those refraining concepts of awareness, appreciation, and action.

Concrete concepts as a bridge

For those interviewees who took the question about connections more literally, I saw less willingness to engage in the thought exercise:

“It’s tenuous at best. It really is. And it’s not the tiger rescue’s fault. It’s just really really hard to make that connection. These are not native species... these tigers are attractions, they’re oddities. It it’s hard for me to go and say, by saving this tiger, you’re helping our environment here in the United States. And you... and you say, ‘by saving this tiger you’re helping the environment in northwest India,’ and people are going to go, ‘Are you kidding?’ And I’m not sure how you can get around that.” (CTR learner 41)

Similarly, this interviewee sees the connection as something that could be made as a thought exercise, but is not convinced that the connection is there in a concrete, real way. Like the previous learner, they use the word “tenuous”:

“Hmm... I feel like if I thought about it enough I might be able to pull out a connection, or something I use might be sourced from an area where it would have an impact on them. I have to say it feels kind of tenuous.” (CTR learner 63)

“It’s the draw in the lemurs being unfamiliar to the people here locally. So it would have to be some sort of a connection between what’s being done with and for the lemurs and bringing that home locally. Otherwise it’s a great exotic, exhibit to go check out to learn about lemurs and then, you know, you go home and you go back to your life. [S: Do you think that there’s any way that learning about lemurs can help with local conservation?] I don’t see it. I mean I’d be open to hearing that connection made when I visit the Lemur Center, to bring it, but from where I am now and what I’ve heard I don’t see the connection.” (DLC learner 194)

“I guess I don’t know how... my recycling here would make a difference for lemurs in Madagascar. I don’t know exactly that connection there. I mean it’s a good thing to do, but as far as, I don’t know if it would have an impact.” (DLC learner 49)

At NCA, learners who took this question literally were still able to see a connection, primarily through the messages about turtle conservation:

“I do remember one comment that the guy made on the behind the scenes tour, again back to sea turtles, that could probably relate to a lot of sea life – and I may be wrong on the facts that he gave me – I think it was Topsail beach where they have the sea turtle hospital, something like 60% of the turtles that came in had consumed plastic. That’s a pretty strong message right there! That we’re putting stuff in the ocean that is hurting the sea life.” (NCA learner 110)

When asked about connecting to larger environmental stuff, this interviewee saw the connection specifically to pollution, but not to other environmental issues.

“The aquarium maybe got more of the message across about the pollution type of stuff, you know... don’t put plastic bags where the sea turtles can eat them type message. As opposed to just the general climate change, or you know, we’re gonna bulldoze the whole country and lay concrete for shopping malls type of thing so all the habitat’s gone. And that’s an exaggeration, but, I don’t think those messages probably came quite across.” (NCA learner 120)

5.3.3. Outcomes

This section explores how the LAIE interacts with the learner to produce change. By visualizing change as movement along a pathway, I identify ways in which learner perceptions shift along gradients. I also report participants’ (limited) negative reactions to the programs. Finally, I outline interviewee behavioral intentions and explore the reasons they generally do not feel compelled to change their behavior.

Pathways

As stated in Chapter 1, learners typically do not have a transformative experience; instead, LAIEs can be considered as a shaping influence in people’s lives (Storksdieck et al. 2005). Indeed, when I asked people about changes, no one offered a story of transformative change, but instead I saw language speaking to reinforcement, reaffirmation, and the idea that they are on a path in a certain direction. But what pathways are evoked and reinforced by these experiences? At CTR, visitors were typically aware that tigers are used in the entertainment/pet industry, but the tour builds on that knowledge by providing detail and information about the severity of the issue:

“I believed a lot [of it] going in, but I may be more aware of the seriousness of the problem of people keeping these animals as so-called pets, or people selling them, marketing them, and how they’re declawed and whatever- I was not aware of that much. And how some people would want to have those animals – it doesn’t make any sense to me how people would want to have an animal like that around, it’s crazy. So more informative to me, and ... made me feel that the Tiger Rescue was a very vital place to help alleviate that problem.” (CTR learner 69)

In this quote, the learner already knew about problems, but was unaware of the seriousness of the problem – background knowledge has been fleshed out with new information about the threats to tigers in captivity. The learner also mentions relief at CTR’s presence, establishing that the agent of change is CTR, not the visitor.

Several DLC learners evoked a pathway of endangered species knowledge. In this pathway, the learner indicates that their knowledge about endangered species and threats to wild animals is cumulative, and that every bit reinforces some of the interest, awareness, or desire to help. This quote discusses this cumulative knowledge of endangered species:

“It’s always a little bit sad to hear about animals that their habitat is being destroyed because of humans. I mean lemurs aren’t the only animals that face that... it’s always disappointing to hear that sort of thing is happening, and the awareness always makes you want to help out as much as you can or whatever. Any way you can I guess.” (DLC learner 37)

This pathway of endangered species learning also opens up the question to this participant of how many other unknown endangered animals exist in the world:

“And I think aside from the message about lemurs was sort of the bigger message about how this is probably one species that has issues and needs support and stuff. Makes you wonder how many other species there are that could use this sort of help and intervention.” (DLC learner 194)

This learner frames the pathway as the accumulation of reasons to be good to the environment:

“I think it’s one more reason to continue being good to the environment. I think that the lemurs, again, they’re shrinking in population, and their habitat is shrinking, and just in my lifetime, things change so quickly, and it would just be a shame to know that my kids or my grandkids wouldn’t be able to see the lemurs. I just think that it’s crazy how – I’m 25, and I feel like things have changed so much in the environment even in my lifetime.” (DLC learner 67)

This quote also evokes intergenerational equity, a form of altruistic values.

Some learners constructed personal behavioral decision-making as a pathway, although this pathway was rare. In one interview (some of which is described in greater detail in Chapter 4), the learner described the relatively long and drawn-out process of becoming a vegetarian, so

that the impact that the NCA tour had on their life was to continue that path forward into more strict vegetarianism:

“I’m probably gonna stop eating seafood. I mean, I really do think that that’s one of the things that may come from this.” (NCA learner 184)

This pathway to vegetarianism was evoked by several interviewees, but this individual was the only one who attributed a major decision on that path to the LAIE.

One advantage NCA has over the other two sites is the greater ability to cultivate a path involving their site alone; NCA visitors are more likely to return repeatedly, as the free-choice learning component allows them to spend more time there than they would if they only could go on a tour. This repeated exposure can be a valuable reminder in the learner’s life:

“I wouldn’t say that it, that it made a great increase. But every time I go [to NCA], I do learn more and it’s a good reminder. ‘Cause sometimes I think we get into our daily lives and we kinda forget, we get busy with other things and then we forget, and ‘Hey, I need to be mindful of these things’. So I think it’s always good to have some reminders. So I look at it more as a reminder, ‘cause I’ve been there so many times.” (NCA learner 542)

“I actually thought the tour was really cool. I thought it was cool that kids thought it was... Because the thing is, first of all, yeah I had been to the aquarium before and I’ve been to aquariums like this a lot over the years, so yeah, it definitely wasn’t for me like an ah-ha moment. It’s, you know... I think the North Carolina Aquarium is a really good starter program for public education. I wouldn’t say I didn’t learn anything, but I didn’t learn a lot, and I’m already pretty passionate about the things that I’m passionate about. I guess we can say it reinforces that, it definitely doesn’t detract from that.” (NCA learner 155)

Negative reactions/Challenging beliefs

Similar to the educator interviews, learners did not identify disagreements between their incoming values and beliefs and what they heard on the tour; LAIEs mostly reaffirmed and reinforced interviewees’ incoming beliefs. The only source of conflict at CTR and DLC was the distress of seeing animals in captivity. However, while several interviewees expressed concerns about the concept or condition of captivity, their positive impressions of the organizations’ work helped alleviate their concerns:

“Well I thought the cages were kind of small in some respects, [compared] to the size of the animals, but I understand that they are a rescue. And if they've been rescued they've been taken out of worse conditions. And I believe that they're doing a good thing with the animals, giving them a home, giving them nutrition, or giving them proper medical care – otherwise the animals might have been put down. So I think they're doing a very good job out there, but it's hard to see, you know? When an animal probably has a territory of 100 mi. or more [in the wild], being confined to something that's 50 x 50, or 50 x 100; they're not meant for cages.” (CTR learner 71)

“Sometimes it makes me a little bit sad, seeing that they don't have a whole lot of space, but I understand that's by necessity, and by cost. And they take care of the animals as best they can, and that makes me happy.” (CTR learner 541)

This DLC learner perceives the organization to be sufficiently trustworthy:

“I can't say specifically [whether the lemurs have enough space] because I just don't know enough about the lemurs, but I guess you know... I trust the Lemur Center, I feel like there's a lot of... I think there's a lot more accountability today than there has been in the past in regards to the treatment of animals, and so I feel better about that. I think I've come to a point where I'm okay with something like the Lemur Center, somewhere where I think that there are really good reasons for doing what they're doing.” (DLC learner 37)

This interviewee was skeptical going into DLC, but her experience convinced her that the organization was doing good work.

“I always wanted to see the Lemur Center because I'd never seen the lemur before, I thought they looked cool. But I didn't really know; why do we have a Lemur Center at Duke? It's like a necessity? Is it just another zoo? I'm always skeptical about that, like it's just exploitation, they want to make money – hopefully they make money for research. So I went in with a little mixed feelings. But the guide was really good, everything she explained, all the questions she answered, especially about where they came from originally, that they sometimes go back, and they are help educating people there, and I love that. It's not just for here; it's really helping the people and the animals there. Because they can. And they want to. And I think that's awesome. So definitely, [I felt] neutral going in, I felt like this is a great thing.” (DLC learner 145)

As shown in the earlier section on important messages, NCA interviewees expressed surprise at how much care was required for animals they had perceived to be relatively low-maintenance. Instead, the challenges to learners' previous beliefs at NCA centered on the unexpected levels of intelligence of animals in the facility (octopi, sharks, otters, and turtles were each mentioned by at least one person):

“It also challenged one of my notions of intelligence. Like we all know that, well sharks are not very intelligent. Most of their brain is devoted to not thinking, it’s mostly a sensory organ. However, I thought it was really cool that the different sharks line up in different places for their food and that that’s sort of, not operant conditioning, what’s the other one? I think it’s like classical conditioning, of associating that location with food, was still taking place with something that I would consider to be, or previously considered to be incapable of that level of thinking.” (NCA learner 155)

“I have a lot more respect for otters. Their brain must be bigger than what we thought I guess, if they’re...if they’re trainable, because I would have never, ever thought that.” (NCA learner 122)

In contrast to CTR and DLC learners, NCA learners did not express concerns about the size of the enclosures or the reasons the animals were kept, even for the otters who are charismatic mammals.

Behavioral outcomes

In addition to asking interviewees about their general pro-environmental behaviors, I also asked if they felt in any way inspired to do anything for the environment or the organization after the tour. By and large, interviewees did not express high levels of desire to engage in pro-environmental behaviors in response to the tour. Interviewees only discussed a limited suite of behaviors they were willing to consider adopting. These behaviors (Table 5.6) largely correspond to the behaviors on the post-survey, although none of the general ecological behaviors were mentioned by participants as potential post-program activities. Interviewees were most likely to commit to engaging in behaviors requiring the lowest amount of personal investment.

The most commonly discussed behavior was the act of spreading the word. The word being spread refers either to participants encouraging others to visit the facility or to participants discussing things they learned on tour. Several interviewees mentioned that they had already spread the word in the time between the program and the interview, and many others indicated they were likely to tell people to go visit the facility.

Only NCA visitors mentioned behaviors directly related to the animals in their habitat. Namely, all interviewees had intentions of engaging in turtle-safe beach behaviors if they had not already been engaging in those behaviors. While CTR houses two native species of cats (bobcats and cougars), the individual agency in conservation is mostly limited to indirect behaviors, such as donating money to conservation organizations.

Interviewees also responded that they would be interested in returning for another tour, perhaps seeking out one of the more expensive tours. However, while interviewees display enthusiasm, they still appear non-committal in these statements.

Interviewees at DLC and CTR identified donating money as the most direct way to help with the causes discussed during the LAIEs. However, none of my interviewees had given money in response to the program; they either indicated that they might give in the future or that they already had previously. At NCA, when asked how to help, participants rarely mentioned giving money; in the one NCA quote, the visitor assumes NCA could use donations, but they do not indicate they were informed directly of NCA's needs. The DLC quote also speaks to the lack of information about financial needs on the DLC LAIEs.

Finally, a few interviewees at CTR and DLC mentioned the possibility of volunteering. While some people provided logistical reasons why they do not plan to personally pursue volunteering (distance, time, money, other commitments), I did not have a single interviewee say they were planning to look into volunteering further.

Table 5.8. Behaviors and commitments from interviewees.

	Behavior	Example
Easier, more commitment	Spread word: facility	<i>"A lot people didn't know about it, yes. And so I think that there's a good amount of people that I talked to that are going to try to go there." (CTR learner 566)</i>
	Spread word: wild	<i>"You know talking about them with peers, you know that's definitely happened, kind of raising awareness amongst my peer group, you know- some of us may end up going- going to Madagascar and helping out there." (DLC learner 37)</i>
	In-situ behaviors	<i>"We found out we were doing things that could harm sea life that we didn't mean to be doing that! Like, just about every year we go out at night and have lots of flashlights, and are looking at the little crabs on the beach, and we didn't realize that we were maybe interfering with the cycle of the sea turtles [S: so did you not do that during this beach trip?] We did not!" (NCA learner 110)</i>
	Attend another program	<i>"I may visit again and I may take one of the more complex tours. The more expensive tours." (DLC learner 39)</i> <i>"My experience on the smaller tour really cemented the thought that I had to come back. But probably still in a client way." (CTR learner 68)</i>
	Donate	<i>"I always do, that's my greatest [strength]; donating money. I'll donate time, in certain places the best way that I can, when I know, when I'm confident that what I'm giving is more than just being a liability for somebody to drag around. And frankly I'd rather not clean cages!" (CTR learner 550)</i> <i>"I would definitely be interested if there was something ongoing or if there was like a fundraiser type of activity; I wouldn't be opposed to someone contacting me and tried to help where I could help with all of that kind of stuff." (DLC learner 43)</i> <i>"Another thing I remember was the amount of water; I forget the numbers, but the amount of water that was cycled through the filters and all that. It's probably a pretty expensive operation. I don't think that was necessarily a key message, but I'm sure all donations would be welcomed." (NCA learner 120)</i>
Harder, less commitment	Volunteer	<i>"I mean, it certainly made me think about it. I haven't really, you know, I guess sort of made a decision about it or anything like that. But it kinda made me think about 'Hey, you know maybe, maybe this might be something to get involved in.'" (DLC learner 552)</i> <i>"[S: Do you think that you would go help tigers?] I don't know. Maybe. I mean, that's possible. There's a lot of things for me that's completely not enough time in anyone's life to help out with everything that they would want to help out with. But it could be one of the things that I would help out with at some point, I don't know." (CTR learner 566)</i>

Why no action?

The reasons interviewees provided for their unwillingness to commit to supporting conservation or the organization beyond attendance were essentially the same reasons they do not engage in general environmental behaviors: lack of time, money, or sufficient interest to engage in these behaviors. As I outlined these barriers to participation in Chapter 4, I will not go into detail on these barriers here. Instead, I highlight some of the organization-specific reasons people chose not to engage with conservation more intensively or directly.

I start with DLC, as their visitors exhibited the lowest behavioral commitment on the post-program survey. The first issue was that lemurs were perceived to be a narrow environmental issue:

“I really enjoyed seeing the lemurs. It was really interesting. They were cute, and I feel sympathetic for their loss of natural habitat. As far as what I took from that in an environmental sense, I don't think I really took anything away. Like it just seems so distant to me. Like, their natural habitat is not somewhere where I can really have a big impact. I mean if I think the number one thing from me personally that I could have an impact is if I were donating money to something, which that's not really, if I were donating money to a lot of things at this stage of my life, that probably wouldn't be like a huge priority for me...that seems kind of like a narrowly focused environmental issue.” (DLC learner 531)

Others expressed doubt about the urgency of the plight of lemurs:

“[S: Do you plan to support the lemur Center in the future?] Probably not. I mean it's hard. Other than going, and possibly going back at some point for another visit, another tour kind of thing. [S: So why do you feel you're not compelled to up your support for the Lemur Center?] Well I guess, I didn't- I guess I didn't come away with a, a feeling of impending urgency about the plight of the lemurs. I didn't leave with that kind of theme.” (DLC learner 49)

Visitors also perceived DLC to be so effective at their work that help was not needed:

“I feel like there's people, you know that are looking after those animals there at the Duke Lemur Center, and animal welfare and other things, so I don't feel like I have to look out for those animals there specifically, and then animals in Madagascar are so far away that it's hard for me to do something to directly impact those animals.” (DLC learner 37)

“I didn't feel like [laughs] I didn't feel like I needed to go out and go to Madagascar and like save the lemurs! Because I felt like, okay they're doing that.” (DLC learner 43)

DLC interviewees also did not remember being told to take any action:

“[S: So you didn't see they actually asked you to take any actions.] No I didn't. No I didn't. [S: Did you feel compelled after going on the tour, even if they didn't explicitly say anything, to do anything to help the lemurs, or to help their environment?] No. no I didn't.” (DLC learner 39)

“Did they suggest any actions to take...? I don't recall, I'm sure - they probably did, but I don't recall specifically. Especially when they were talking about the, there's that first kiosk that we went to, with the map, you know talking about the - the loss of habitat in that kind of thing. I think that's probably kind of addressed at some point there, maybe.” (DLC learner 49)

CTR had the next lowest rates of behavioral commitments based on the post-program survey. While most participants cited the general barriers of time, money, and distance, the spiel at the end of the CTR tour garnered mixed reviews, leading to some apprehension towards supporting CTR. For example, on one end, this CTR interviewee expressed dislike for the pitch at the end of the tour:

“Inside of me kind of groaned as we went back into the building 'cause I knew what was gonna happen, but at the same time I knew it was a necessary evil, it's kind of like when PBS does their telethons, this is how this works, they need money to stay afloat... the [pitch] at the end wasn't compelling because I live in Raleigh, so I'm quite a distance away for it to be practical for me personally to get to the facility to take part in any of these like, more intensive activities or more involved activities with Carolina Tiger Rescue. I guess I'm not sure, I know that it costs a lot of money to sustain all those cats and stuff, and I think it's like the stuff with - it's just – I would want to know exactly where all the money was going, and I know it's all volunteers, it's not like they're running out of some mansion, but I think we need more details, and I guess I wasn't compelled by the way [the guide] presented it.” (CTR learner 58)

On the other end, this interviewee believed that they could have really pushed the ways to get involved even harder than they did:

“I thought they were a little subtle, actually. Compared to where I've been in other places, where it's like, there's a donation bucket by the door, and when you come in the first thing you see is a five foot sign that says, "Be a member!" You know that's obnoxious, but I think that they're still a little...shy about asking for support. I mean the Girl Scouts peddle cookies harder!” (CTR learner 551)

Finally, this interviewee found the spiel to be appropriately targeted, even though this person typically bristles at these kinds of financial requests:

“I heard some donation stuff I guess. And then also the volunteering stuff. I definitely got that from it. They were always interested in people volunteering and helping out. They rely on that a lot so. [S: Did you see those messages as like positive things or –] Oh, absolutely. It was definitely a positive thing. It was good. Yeah, definitely it was not too much. Because I’m very averse to that type of thing, I don’t do too well with salespeople.” (CTR learner 566)

Much like the DLC visitors who perceived lemurs to be a narrow issue, this interviewee also comments on the limited impact of helping the animals at CTR, even if he felt emotionally tugged in that direction:

“I particularly was struck by the tiger with the cancer in its paw. That made me really sad. And I also, drew the comparison, to I guess its mate, or, I guess it used to live with another cat that has since passed, and he had a similar exposure to whatever situation before Carolina Tiger Rescue got it. And it also had cancer. And so I was thinking, that’s really terrible, and those are the kind of like stories that make me want to get more involved, or at least talk about it with other people. So I think people can sleep a little better at night knowing that they helped out an individual animal, but it doesn’t really amount to much on the grand scheme of things, and unfortunately that’s just the facts of the matter.” (CTR learner 58)

The learner also highlights the egocentric benefit of helping animals to “sleep better at night.”

At NCA, when I asked visitors what they could/would do to help, individuals cited the beach-specific behaviors, so we did not usually discuss the reasons they choose not to change their behavior. The only passage I found focused on otter conservation, and it brings up the issue that the visitor is not at the right scale of action:

“No, I mean even though I didn’t know anything about otters, really, the fact that I know that they’re smarter than I thought, doesn’t really change anything. It’s not like I was dumping chemicals in the river and now I’m stopping because, you know, just because this otter showed its paw to me.” (NCA learner 122)

5.4. Discussion

5.4.1. Predictors of behavioral intentions

While behavioral intentions scores were quite high across sites, interviews revealed minimal commitment to engaging in new environmental behaviors. The use of mixed methods highlights the limits to the use of behavioral intentions as a placeholder for behavioral behaviors in survey work (Ballantyne and Packer 2009, Gatersleben et al. 2002). However, comparison

across sites and populations can still illuminate how the educational programs might impact behavioral intentions, so long as these limitations are kept in mind.

First, participants who feel a greater sense of personal environmental responsibility tend to have higher behavioral intention scores. This result makes sense because an individual who has a greater sense of personal agency will be more likely to see themselves as capable of performing the environmental action at hand (Hines, Hungerford and Tomera 1986, Kollmuss and Agyeman 2002). I also found that high scores on the AAS led to higher overall behavioral intention scores. While I could not find any specific studies that looked at the AAS's ability to predict environmental behavior, this result does support previous research showing that animal perspective-taking contributes to greater environmental concern (Schultz 2000). The NEP significantly predicted a handful of behaviors, but had no significant effect on the overall behavioral metric. While some researchers have found that the NEP leads to pro-environmental behavior (Stern et al. 1995), previous research conducted in North Carolina has also found that worldviews do not contribute to environmental behavior predictions (Nooney et al. 2003). Others have found that individually specific barriers and opportunities to action make predicting environmental behaviors difficult (Gardner and Stern 1996), and in my study population, these individualized contexts might be a large contributor to individual behavioral intentions.

While VBN theory suggests that all three types of values could lead to environmental behavior under the right conditions, my data shows that biospheric values explain a significant amount of the variance of the mean behavioral metric, but egotistic and altruistic values had no predictive power for any of the behavioral outcomes. While this result is not surprising per se, some scholars make the argument that altruistic and biospheric values orientations are more similar to each other in that their underlying values are self-transcendent (Taylor and Signal

2005), whereas egotistic values are self-preserving (Schwartz 2012). So while some scholars argue that the egotistic values represent the outlier of the three (a division between self and other), my results support the idea that egotistic and altruistic together represent anthropocentric values, sitting in opposition to biocentric values (Gagnon Thompson and Barton 1994, Schultz 2000). This result suggests that in animal-themed environments, appealing to biospheric values orientations might be more effective at creating a sense of moral obligation than egotistic or altruistic orientations.

5.4.2. Behavioral intentions across sites

Some of my results are more consistent with expectations regarding the environmental behaviors on the form. I hypothesized that at institutions where more behavioral directives were given, learners would be more likely to commit to those behaviors, and NCA gave the most explicit behavioral directives and had the highest behavioral intentions in environmental behaviors. Similarly, the strong “not pets” messages at CTR and DLC correspond with survey responses indicating that CTR and DLC learners were less likely to say that they would seek these animals as pets than visitors at NCA. The lack of attention to private aquariums in general speaks to the low level of threat NCA ascribes to private ownership, which might be problematic from a welfare perspective (Hastein, Scarfe and Lund 2005). Lastly, NCA visitors were more likely to seek out similar facilities, which is an expected result because specialty organizations have fewer peer institutions, so participants might perceive finding similar facilities to NCA more feasible than finding comparable rescues or research facilities.

One would expect that organizations who asked for more help would have more learners intend to help them, but I did not obtain this result. CTR asks for the most organizational support, and NCA asks for the least, but NCA’s visitors were most likely to indicate that they

would support the organization financially in the future. This result suggests that participants are deciding whether to support the organization based on factors outside of LAIE content. As for the mean behavioral intentions scores, NCA's learners posted significantly higher behavioral intention scores than DLC learners and nearly significantly higher scores than CTR learners. This result can be considered relatively unexpected because of a variety of factors: NCA visitors are on average less educated/more conservative, and NCA educators never ask for direct assistance in their programs. Additionally, those at NCA are arguably the least conventionally charismatic animals of the three facilities.

I posit that a variety of organizational characteristics drive these behavioral intention scores. I think the most important difference might be the long-term relationship between the organization and the public. A visitor on an NCA program had visited the facility an average of 4.5 times before their LAIE, compared with .5 at CTR and .2 at DLC (Chapter 4). Evoking the pathway narrative in which VBN is cultivated over time (Rickinson 2001), NCA's ability to offer free-choice learning experiences that audiences can engage in many times over many years allows NCA to play a more significant, direct role in an individual's pathway towards environmental care and action. So when an individual attends an LAIE at NCA, they have already been primed on multiple occasions by other educational messages, and are perhaps also better primed to make commitments (to NCA and to general environmental behaviors as well).

Second, the educator's ability to ascribe responsibility to the individual is more limited at CTR and DLC. At NCA, learners have direct options to engage in positive behaviors for turtles, but this is not possible for the animals featured at CTR and DLC. But this explanation has limited scope, as NCA visitors also claimed they were more likely to support the *organization* as well, something that is equally feasible at all three sites. So this fact strengthens the first

argument that NCA visitors scored higher on organization-specific behavioral intentions because learners have more *opportunity* to engage with NCA in varied ways. Also, while CTR creates an image of a relatively needy organization, and DLC learners commented that DLC was *so effective* they did not perceive their help to be needed, NCA falls in the middle by not showing they are either needy or highly successful. Perhaps this “goldilocks” approach is just the right amount of neediness to get participants interested in helping.

Third, NCA is the only facility at which specific in-situ behaviors are recommended during the program. One could argue that CTR and DLC cannot compel individuals to engage in in-situ behaviors that help their species of animals, but my interview data shows that participants are willing and able to make connections between their lives and in-situ conservation using their pre-existing values, beliefs, and norms as a bridge. There is likely untapped potential at all three sites in terms of developing action competency in environmental behaviors.

Fourth, even for first-time visitors, NCA is a relatively generalist organization as opposed to the specialized focus at CTR and DLC. NCA may have an advantage as an organization for which visitors are relatively well-prepared. In other words, visitors have had a lot more exposure to their type of zoo/aquarium environment than they have to the more specialized organizations, so NCA does not have to establish their work and their identity as an organization to the visitor. Interview data showed that while CTR and DLC visitors recall important messages that are tightly intertwined with the activities and missions of the respective organization, NCA interviewees recalled important messages that focused more exhibit care at the facility, which is the specific and stated goal of the behind the scenes tours, yet the NCA sound bites focused much more broadly on ocean ethic and care. So while NCA visitors highlighted the specifics of

that particular education program, they also see that program fitting into the larger promotion of an ocean ethic at the aquarium, even if that connection was not explicitly made on tour.

5.4.3. Important messages

Across all three sites, the important messages listed by both survey respondents and interviewees track with the institutional missions and educational intentions at each site. They also track with the VBN pathways in Chapter 3: CTR visitors identified the welfare/individualist messaging, DLC visitors picked up on the mostly environmentally themed messages, and NCA visitors identified the care for the on-site exhibits, local environment, and their responsibility to help with conservation efforts. These differences reflect the educational goals at each site, but what's most interesting to note is that ecological/environmental messages were also included prominently in every program at CTR, but most audience members did not list any environmental/ecological statements as important messages. Similarly, messages about not keeping these animals as pets were included on tours at DLC and NCA, but also did not show up in survey responses as important messages. This result validates the most important rule of interpretive practice: each program should have one unifying theme with a limited number of sub-themes to best encourage audience message retention (Ham 1992). So even though CTR educators discuss ecological significance in more ways than educators at NCA (Chapter 3), their ecological messages are competing (and losing) with their messages about animals in captivity. Similarly at NCA, even though a lot of environmental information is presented in the programs, animal care messages were more salient to interviewees because that was the theme of the LAIE.

Visitors also identified the missions of each organization with great accuracy. This suggests that during the individual's decision to attend the program and/or the LAIE itself, the organizations/educators are being sufficiently clear about their activities and goals so that

audiences can understand and communicate them accurately. None of the organizations are suffering from substantive mission drift, meaning that their missions can be considered to be an accurate representation of their activities (Merriman and Brochu 2009).

These results speak to the limited ways in which animals are being framed as ambassadors for general environmental messages at the three sites I studied. Tying the animal to bigger environmental values depends on either the educator or the learner to make these connections explicitly, and across all three sites the educators rely mostly on the learners to make these connections themselves. While interviews suggest that some learners are making those connections, others with more literal interpretations of how their lives are connected to the animals might benefit from more attempts by educators to *build* those connections during the programs. Interviewees were receptive to the inclusion of more explicitly environmental language in the programs, and the inclusion of more general environmental beliefs messaging might help further activate the environmental values, beliefs, and norms that are already highly developed in many participants.

The ability to abstract the animal into broader environmental messaging might also be hindered by the requirement to explain the organizational context. Interviewees at CTR and DLC expressed concerns about animal welfare to the point that they could only enjoy programs in these settings if they are assured that the care is good and the reasons for keeping the animals are just; this requirement presents both an opportunity and a challenge. The challenge is that the focus on the animal's individual life leaves less time/ability to abstract to larger environmental concepts, something that NCA educators have more freedom to do because they do not appear to be required to explain individual animal histories. And of course, all three sites attract visitors who are seeking entertainment opportunities as well, and those visitors present both an

opportunity (as a diverse audience) and a challenge (as an audience without as much previous knowledge on environmental topics).

The institutional context is also an enabling factor in learning. Because learning is context-dependent (Lave 1988), the educator's ability to abstract beyond the immediate animal may always be limited. The context helps connect learners to the mission and the facility, and people are more likely view a site as educational if they feel personally grounded in the topics featured at the site (Falk and Dierking 2002). Interview results also indicate that some participants attending programs at CTR and DLC are not comfortable attending programs in zoos, suggesting that the context matters deeply to their decision to attend a program. So while the context does present limitations in how to construct a VBN pathway for the learner, the organizations can all use their unique contexts to help visitors connect to their specific work and thus learn more in the process. Truly, all of the organizations face the challenge of incorporating messaging that celebrates their core values and activates more general types of environmental care in participants.

Another limit to the control of educational content is how much it is driven by the presence of specific individual animals at all three sites. For example, the entire "no pets" message at NCA hinges on the one diamondback terrapin with a deformed shell. If that animal dies or is taken off tour, their entire message about not keeping animals as pets would be eliminated unless they made the active choice to include it along with another animal, but the salience of the message is much greater when looking at a deformed turtle. This is also the case at CTR, where the binturongs convey the ecological importance of seed dispersal, but since I collected my data, the last binturong on the tour path died, eliminating CTR's message about forest canopy health in Asia. While another animal may come along with another important

message attached to it, these individual animals highlight the somewhat random ability of educators to include critical messages that tapping into important values about the human relationship with animals.

5.4.4. The value of the animal

The site-specific answers to the survey question about the importance of wild animal conservation match the VBN pathways of each organization/animal. Learners at CTR, where the individual welfare perspective is most strongly evoked, were the most likely to cite welfare-based reasoning for the animal's value. Learners at NCA, where individual-specific behaviors are presented, were most likely to reinforce the need for us as a society to help with conservation. Learners at DLC, where the organization's conservation work is featured most prominently, had the highest number of people indicate that conservation is needed, the lowest number of respondents ascribe responsibility to the general public. These results reflect the VBN pathways of the animal as individual, species, or local ecosystem, and they echo the societal constructs for the rights of the three different groups: Tigers and other cats enjoy the highest levels of "personhood", lemurs, as relatively poorly known primates, come next, and finally, aquatic animals have the least political cache of the three (Czech et al. 1998). Because the organization is replicating the societal framing of these animals (as an individual, species, or ecosystem), experimental research in which the educator frames the animal in other ways would help uncover how much of these framings are societally driven and how much is under the control of the educator or the organization.

This last point brings up an important distinction between the three sites. While all three of them lay out a VBN pathway, the learner baseline when exposed to these messages is different at each site. At DLC, many learners knew nothing of lemurs. Thus, DLC educators have to

establish the valued object as the lemur, as many of the interviewees stated they had little to no knowledge about lemurs before the program. At CTR, while learners are already aware of and value these wildcats as a group, they were most surprised to hear about the severity of the problem of captive animals in the United States. To use VBN language, the threat to the valued object was the place at which learning was most palpable. At NCA, the baseline is that the visitor already knows the organization and has a very positive relationship with the ecosystem (the beach/ocean most notably), so they learn how those animals need *care* – this care can come either in the form of the captive animals (people not realizing how much work is required to keep an aquarium functional) or in the wild (people not realizing how much help turtles need on the beach). So each organization has a different increment of learning they are targeting, and some are more easily linked with behavioral recommendations than others.

5.4.5. Preaching to the choir

In lieu of transformative change, interviewees evoked pathways of learning more about something about which they already cared. Learning about the severity of the problem of wildcats in captivity, the needs of another endangered species or the animals on local beaches who need assistance, learners all spoke of pre-existing care and knowledge that helped them frame the program. The words reinforcing, reminding, reaffirming, came up more frequently than the concept of transformative change. This finding supports the argument that preaching to the choir has value; the literature on behavior change says that *repeated* exposure to a message is the most important way to both facilitate behavior change and maintain current behavioral choices (Falk et al. 2009). In fact, the shared system of beliefs helps visitors make those connections without help from the educators. This is the value of preaching to the choir: the coded VBN language is understood. Implicit code for the “choir” that says that when we talk

about these animals, it does indeed represent bigger issues with humankind wreaking havoc on nature and having a responsibility to fix it. Hidden undertones of values and worldview are reinforced when animals are talked about, even when relatively values-neutral facts and figures are the topic at hand.

So while preaching to the choir has critical benefits, the next question then becomes, “what is each site reaffirming?” Even though CTR educators spend a large amount of time talking about the ecological significance of each animal in the facility and threats in the wild, this theme showed up very infrequently in CTR learner surveys and interviews, suggesting that audiences found their primary messages about animal welfare sufficiently compelling that their values about other environmentally themed topics were not activated to as great a degree. DLC visitors, on the other hand, recalled general ecological concepts and issues facing lemurs in Madagascar, but their own sense of personal responsibility was not activated by the programs at DLC. NCA’s visitors’ general appreciation for aquatic ecosystems was activated, and along with that, their sense of agency was activated by the behaviors they were given to help, but the animals did not activate a sense of individual welfare concerns. So while animals can help develop empathy, leading to the expansion of one’s moral circle, my results indicate that if an organization asks audiences to see an animal as an individual, this might get the audiences to empathize with the animal, but the expansion of the moral circle might stop at the individual, and the connection to wild animals and the environment might not be made. This represents a potential risk of using animals as interpretive companions without considering the ways in which the value of the animal is being constructed. While I do not suggest that one framing is inherently more valuable than another, my results indicate that these framings do impact what messages compel learners in each environment, and so greater attention towards the framing

process could help streamline educational content and make sure that important messages are not lost on the visitor.

5.4.6. Goal-setting and skill-building for environmental care and action

The education goals at all three of my sites fall in line with the larger move in free-choice learning settings towards education for environmental awareness and conservation action (Groff et al. 2005). Yet, during LAIEs, the time spent building skills was either minimal or nonexistent and very few of the audiences' "important messages" involved skills or action. While behavioral intentions were quite high on the post-program survey, interviewees perceived very little action-oriented messaging in the programs and felt minimally compelled or prepared to engage in any new conservation behaviors. The educators in Chapter 3 wanted people to make behavioral changes based on their own interests, but the learner data suggests that while learners have positive feelings towards environmental behaviors (indicated by willingness to commit to behaviors on the post-program survey), that upon further reflection they were not planning to make any major behavioral changes. The higher behavioral intentions of NCA survey respondents might suggest that discussing very specific and relatively easy behaviors might not only get learners to engage in those behaviors, but might set off an interest in finding further behaviors in which to engage; NCA visitors scored higher on looking for new ways to help the environment and showed a greater commitment to the beach-specific behaviors in interviews than interviewees at other sites did for the limited suite of behaviors they heard of on their programs.

As discussed in Chapter 3, the environmental impact of all of the behaviors mentioned during LAIEs is limited. However, while filling in holes in the sand might not be as high on the environmental impact chart as buying a hybrid vehicle, my survey results indicate that this

attention to the concept of “ways YOU can help” might actually lead to other types of behavioral commitments. NCA visitors most frequently listed “ways you can help” as important messages, and they ascribed more responsibility to themselves to help with conservation of animals in the wild in general, and they were more likely to seek *other* ways to reduce their impact in the wild. This supports previous work showing that even relatively small changes in behavior can lead to a greater ascription of responsibility to the self and an increased sense of personal control, both of which can lead to larger-scale changes in the future (Cleveland, Kalamas and Laroche 2005). Collecting follow-up data with survey respondents and interviewees would help uncover how many of the intentions are realized post-program, contributing to a greater understanding of the long-term effects of LAIEs on the learner.

5.4.7. Potential negative outcomes

One potentially confounding tension is between that of personal relevance and egotism. Egotistic values are considered to be a potential determinant to environmental behavior, but they have the weakest relationship, and in some cases have been proven to have a negative relationship (Schultz and Tabanico 2007). While self-actualization can help us feel compelled to take environmental action, an egotistical values orientation without an accompanying environmental worldview will not lead to pro-environmental behaviors. But when an organization shows animals to people in the hope that they will expand their moral circle to include these animals, theoretically the same divide occurs – those with a pre-existing environmental worldview might be more inclined to include this animal in their moral circle, but someone without that environmental worldview might only see the experience as a self-fulfilling opportunity to be close to a wild animal. This difference is emphasized by comparing those individuals who were able to see connections between their lives and the animals vs. those who

could not see connections; pre-existing environmental VBN characteristics allow what could be a self-serving experience to transcend into an opportunity to develop care.

The inescapable anthropocentrism of holding animals in captivity for human purposes was not directly addressed at any of the facilities, and the implications of this for the development of biocentric values remains an important area for future research in animal-themed facilities. One could certainly consider whether it would be a more powerful animal-rights message to ban the public from seeing animals in captivity, because these animals cannot grant us permission to do so. In other words, even if one is inclined to expand their moral circle in response to exposure to a captive animal, what subliminal message of domination and control does it send when we get to see these animals up so close in the first place?

5.5. Conclusion

Overall, the core message retention from the institution through the educators to the learner is quite high. LAIEs at each site are designed to communicate key messages about the value of the animal, and by and large visitors identified the key messages correctly. However, framing the animal as an individual, species, or ecosystem has implications for how visitors might feel compelled to expand their moral circle. While learners are perceiving messages accurately, the question of whether the messages the organizations have selected are the most important ones given their goals of inspiring visitors to take meaningful environmental actions still needs to be addressed. Also, while the “choir” is adept at linking environmental messaging to their pre-existing environmental values, beliefs, and norms, more explicit linking may be necessary if the education programs are to be successful at reaching more diverse populations.

Both interview and survey data suggest that compelling individuals to commit to behavioral intentions requires some direct effort on the part of the educator. Within each VBN

pathway, the ascription of responsibility to the individual, organization, or other entities does seem to have an effect on whether individuals feel compelled to take action. The learner's relationship with the organization itself might also play a role, so quasi-experimental program design would be an effective way to tease out the difference between the effect of the organizational relationship versus the LAIE messaging.

Educators at all three sites expressed hope that their learners engage in pro-environmental behavior after their program, but more effort is needed at all three sites to develop action competence in the learner. The generally positive responses from learners towards environmental values, beliefs, and norms, suggests that incorporating these types of messages would be received positively across sites, and perhaps lead to a greater activation of the norms that would enable behavioral change.

6. CONCLUSION

6.1. Key messages

This work investigates how the communication of environmental values, beliefs, and behavioral norms related to conservation varies across institutions with different missions. Each of my results chapters uncovers a key message that can be used to better design educational content for pro-environmental behavior change.

First, while all three facilities share common goals of promoting general environmental awareness and action, different institutional framings impact which types of environmental values, beliefs, and behavioral norms are emphasized in the program. CTR emphasizes the animal as an individual in their LAIEs, DLC emphasizes the animal as a species of special concern, and NCA uses animals to communicate general environmental conservation messages. Framing of the animal as an individual, species, or ecosystem has implications for how visitors expand their moral circle. I find that organizational context matters deeply to the framing of educational content, which can be both an asset and a hindrance to environmental learning. Alternative frames might lead to clearer communication of key messages and organizational objectives regarding changing participant behavior, which can in turn have both individual and social benefits.

Second, my examination of the learners suggests that while audiences across all sites have high levels of environmental awareness and stewardship, visitors do differ across sites in terms of their demographics and incoming values, beliefs, and norms. In particular, visitors select learning experiences that reinforce their pre-existing environmental values. Thus, while

they can be considered to be “the choir” in terms of their generally pro-environmental values, beliefs, and norms, I argue that the field should take a more nuanced approach to understanding visitors across sites, as this will help institutions better design programs to meet learner needs. .

Third, learners differed across sites in their post-program behavioral intentions, with NCA visitors indicating they were most likely to adopt pro-environmental and organizationally-supportive behaviors in response to the program. NCA’s relative success in activating learner behavioral intentions is attributed to two features of their educational programs. First, as a free-choice learning institution, learners return for repeated exposure to the organization, animals, and messaging at NCA more than they do at the other sites. This might explain why visitors were more likely to indicate they would support the organization even though the educators did not ask for help during the program. Second, their education programs explicitly ascribe responsibility to the learner for environmental stewardship, which may activate their sense of moral obligation to help the environment, so that they are more likely to intend to engage in pro-environmental behaviors, even ones that were not suggested directly in the tour. This result suggests that other organizations interested in cultivating help from their learners both for their own work and for environmental improvement might improve their ability to meet these goals if they work to incorporate these features into their own educational programming.

6.2. Contributions to theory

I make three contributions to the development and use of VBN in LAIEs. First, by coining the term LAIE, I create a new distinction for animal-themed education that isolates the key elements of personal interpretation of animals while allowing for diverse educational contexts. The concept of LAIEs could be useful in future studies that are similarly interested in exploring the unique phenomena of nature interpretation using animal ambassadors.

Second, by developing VBN pathways, I advance VBN theory by improving our understanding of how values, beliefs, and norms are operationalized in practice. The theory as it stands considers environmental values, beliefs, and norms at the broadest level, but in these settings these ideas are operationalized in specific ways; VBN theory proves to be useful in understanding specific contexts in addition to more generalized ones.

Third, I also present a way to use VBN theory to frame and evaluate education program design. This study finds that VBN theory can be used to frame educational content so that a program can create VBN pathways to appeal to the learner's incoming values, beliefs, and norms. Educators and organizations can use this framing to design programs that better meet their own goals for learner outcomes in LAIEs.

6.3. Threats to validity

The organizational comparison represents the greatest threat to both internal and external validity. Internally, the sites themselves differ on a variety of characteristics. I was unable to account for all of these differences in my analysis; doing so would have forced me to sacrifice detail in other areas. I have argued that the three organizations are similar in many ways, and that they might be too similar for these results to be generalizable beyond these organizations. The use of mixed data collection methods corrects for some of the potential limitations of studying organizations that are both similar and dissimilar.

The sampling of both educators and learners also represents a threat to validity. As I depended on voluntary kindness for participation, I may not have captured individuals who are less interested in considering the focal topics in this study. While I offered an incentive raffle to help minimize this effect, my sample likely has a pro-environmental perspective more so than a random sample of the visitor population would have. The social desirability of pro-

environmental sentiments in these contexts also might have led visitors and educators to describe themselves as more environmentally conscious than their real-life behaviors would suggest.

The problem of social desirability points to perhaps the biggest challenges to validity in this context: the limitations of self-reported behavioral metrics. While there is some relationship between intention and action, the relationship is not strong enough to make real inferences on post-program behavioral intentions based on my survey results. Instead, behavioral intentions must be considered a measure of intention, not of action. The comparative lens helps create meaning from behavioral intention data (in that I measure intentions across sites as opposed to intentions as a proxy for behavior), but this limitation is nonetheless a barrier to understanding how LAIEs can lead to behavior change.

6.4 Recommendations

I find that VBN pathways are being constructed at each organization, yet educators and administrators do not engage in this process intentionally. More explicit consideration of how to use the concept of VBN pathways to design education programs to promote the behavior change that the organization wishes to promote would be a useful first step in improving the LAIE's ability to shift the learner towards more pro-environmental values, beliefs, norms, and behavior.

I also find that there is sufficient diversity in learner populations across sites that these types of organizations would benefit from undertaking thorough learner analyses. This type of information could help animal-themed organizations better understand their guests' incoming experiences, values, beliefs, and norms so that educational programs can better communicate environmental ideas to the learner.

Finally, educators at all three sites largely allow the visitor decide how he or she would like to engage in pro-environmental behavior, but drawing more explicit connections between

the LAIEs and general environmental conservation could help activate a sense of personal responsibility in the learner that might lead to higher commitment to pro-environmental behavior. At the very least, educators could consider being more aggressive with establishing behavioral norms that align with their audiences' incoming norms, which could lead to a higher likelihood that behavioral change would ensue.

I also offer site-specific recommendations for CTR, DLC, and NCA. CTR would benefit from more discussion about whether they are sufficiently meeting their goal of saving cats in the wild, as my data indicates that learners are not identifying wild animal conservation messages as important messages at CTR. DLC could spend more time identifying ways learners can get involved in animal conservation, as they currently spend little time establishing the learner as an agent of change for lemur conservation. Finally, NCA could use their already strong ascription of responsibility to the learner to promote more environmentally impactful behaviors such as energy or water conservation.

By offering these suggestions, I do not mean to imply that getting learners to change their behavior is a simple task. On the contrary, compelling individuals to change their behavior is an enormously difficult task. But more attention paid to the ways in which VBN pathways are constructed and the ways these messages interact with the learner can increase the likelihood that behavioral changes will indeed result from exposure to LAIEs.

6.5. Future directions

I plan to continue to work with my current data and to collect other data that can inform this research agenda. First, I plan to conduct a more rigorous content analysis with my LAIE data. I recorded over 100 education programs, and a quantitative analysis of how time is divided between messages would provide a more rigorous comparison of LAIE content across sites.

I will also use the card-sorting data from the learners to develop a more detailed analysis of how learners construct environmental meaning in their lives. This analysis would have impact beyond LAIE research, as it would contribute to the development of methods to uncover SLE narratives in individuals across diverse populations.

As for future data collection, I plan to include other types of educational organizations into future analysis to expand my comparative database. In particular, I will include zoos and nature centers, as many of these institutions offer similar guided experiences under diverse missions. I also plan to collect longitudinal data with learners, as more understanding of how learners incorporate messages into their long-term environmental beliefs systems is needed.

Finally, the most promising future direction for this work is experimental program design. At this point it is unclear how much of the learner response is dictated by the institutional/animal context or by the specific messages included in the LAIEs. Modifying the LAIEs to target different VBN pathways within one institution or changing the pathway to ascribe responsibility to different actors would help elucidate the level of control an institution has over learner outcomes.

6.6. Final thoughts

This research investigated the process of communicating environmental values, beliefs, and norms from the perspective of the institution, the educator, and the learner. I find that the communication process itself is highly effective; in other words, learners accurately identified core educational messages communicated in LAIEs. These messages interacted with what they already know to produce shifts in pre-existing beliefs that again coincide with the specific organizational context. But the critical question that remains is whether those messages are the messages that can best contribute to the development of an environmentally minded citizenry.

While each organization is somewhat limited by its own context, more consideration of societal impact of educational messaging would help LAIEs meet goals for the institution and beyond. In particular, considering the animal as individual, species, or ecosystem has real implications for how society develops care and a sense of responsibility for environmental conservation. While these organizations may not be able to deliver transformative experiences in a short LAIE, they can be more intentional about what types of environmental values and beliefs they want to activate in order to shift and/or strengthen those values and beliefs towards more environmentally friendly forms. If all of these types of organizations considered these larger goals, this process could contribute to societal-level shifts towards more care for and action on behalf of the environment.

APPENDIX A: KEY INFORMANT GUIDE

HISTORY:

1. Tell me how you first got started working here. Why did you choose this facility and not others? What led up to the decision to take this job? Why do you like working here?
2. Tell me the history of the organization in your own words. Why was it founded? What was the original mission? How has that shifted over time?
3. How did education first come into the organization? What are the most important ways you engage with the public at this facility?
4. What is the relationship between the information on the tour and the other public outreach materials?
5. Tell me about the highs and lows of the organization's past. (or highest and lowest point).
6. How is this organization unique from others of similar nature?
7. Who at this organization has been most instrumental in creating the mission? Can you tell me about their story?
8. How has this organization's reputation changed over time?
9. If you could change something about this organization, what would you change?
10. What are some of the best characteristics of this organization?
11. What are some of the challenges this organization faces in terms of carrying out its mission?
12. What accomplishments are you particularly proud of?

THE TOUR:

13. What is your assessment of the strengths and weaknesses of the public tours?
14. What are some of the most important messages you hope the public takes home with them?
15. How do you think your goals in this regard match up with reality?
16. Is there anything you wish your educators could say during the tours but you feel like they shouldn't?
17. Do you see any conflicting messages here between what the public perceives and what the reality is behind the scenes?
18. Has working here shifted your feelings towards animals or the environment in any way? If so, describe.
19. What other similar programs have you experienced at other facilities? How would you compare the programs you give here to any other types of live animal programs you've seen in the past?
20. Do you think you change the way people think about these animals? If so, how?

VALUES:

- 1) Why do you think it's important for this facility to exist? What purpose does it serve?
- 2) What value does this facility have for humans?
- 3) What value does this facility have for the natural environment?
- 4) Why are these animals important to conserve? For you, for human society, for the environment at large (ask each separately)?

NORMS:

- 1) Do you think it's important for society to address environmental issues? If so, in what ways should we be addressing these issues?
- 2) What environmental issues are the most important ones, in your personal opinion?
- 3) Do you think the work of this organization helps to address larger environmental issues? Why or why not?

- 4) Do you feel a sense of obligation to take pro-environmental actions in general?

BEHAVIOR

- 1) What are some of the most important things one could do for these animals, in your opinion?
- 2) What kinds of behavioral information do you include in the public outreach materials and tours?
- 3) Is there any information about how you can help that you wish you could include in the program but can't for some reason?
- 4) How would you characterize the connections between helping these animals and helping the environment as a whole?
- 5) What behaviors do you think are the most important ones that someone could engage in to help the environment? Do you think this facility promotes these behaviors in any way?

WRAP UP

- 1) Where do you see this organization headed in the next 5 years?
- 2) Is there anything that I have not asked you about in regards to your values, thoughts, opinions, and attitudes towards the environment that you think I should have asked about?
- 3) Would it be ok with you if I contact you if I have any more questions?

APPENDIX B: EDUCATOR INTERVIEW GUIDE

BACKGROUND:

21. Tell me how you first got started volunteering/working here. Why did you choose this facility and not others? What led up to the decision to take this job? Why do you like working here?
22. If you could change something about this organization, what would you change?
23. What are some of the best characteristics of this organization?

THE TOUR:

24. What is your assessment of the strengths and weaknesses of your public tours?
25. What are some of the most important messages you hope the public takes home with them from your tours?
26. How do you think your goals in this regard match up with reality?
27. Is there anything you wish you could say during the tours but you feel like you shouldn't?
28. Do you see any conflicting messages here between what the public perceives and what the reality is behind the scenes?
29. Has working here shifted your feelings towards animals or the environment in any way? If so, describe.
30. How has your delivery of the tour shifted over time?
31. What other similar programs have you experienced at other facilities? How would you compare the programs you give here to any other types of live animal programs you've seen in the past?
32. Do you think you change the way people think about these animals? If so, how?

VALUES:

- 5) Why do you think it's important for this facility to exist? What purpose does it serve?
- 6) What value does this facility have for humans?
- 7) What value does this facility have for the natural environment?
- 8) Why are these animals important to conserve? For you, for human society, for the environment at large (ask each separately)?

NORMS:

- 5) Do you think it's important for society to address environmental issues? If so, in what ways should we be addressing these issues?
- 6) What environmental issues are the most important ones, in your personal opinion?
- 7) Do you think the work of this organization helps to address larger environmental issues? Why or why not?
- 8) Do you feel a sense of responsibility to take pro-environmental actions in general?

BEHAVIOR

- 6) What are some of the most important things one could do for these animals, in your opinion?
- 7) What kinds of behavioral information do you include in the public outreach materials and tours?
- 8) Is there any information about how you can help that you wish you could include in the program but can't for some reason?
- 9) How would you characterize the connections between helping these animals and helping the environment as a whole?
- 10) What behaviors do you think are the most important ones that someone could engage in to help the environment? Do you think this facility promotes these behaviors in any way?

11) How do you rate yourself on those behaviors?

WRAP UP

- 4) Where do you think you'll be in 5 years?
- 5) Is there anything that I have not asked you about in regards to your values, thoughts, opinions, and attitudes towards the environment that you think I should have asked about?
- 6) Would it be ok with you if I contact you if I have any more questions?

APPENDIX C: INTERVIEW GUIDE 2012

THE TOUR:

1. Walk me through the program you experienced so that we can both be on the same page about it. What in particular did the tour guide do that was memorable in either a good or bad way?
2. What were some of your reactions and impressions of the program? (can use this prompt during Q1) Was there anything said during the tour that rubbed you the wrong way? Anything that created a particularly strong reaction from you (not just what the guide said, but from any aspect of the tour)? Specifically any emotional reactions?
3. Does this experience change your feelings towards animals or the environment in any way? If so, how?
4. What other similar programs have you experienced at other facilities? How would you compare the experience you've had here to any other types of live animal programs you've seen in the past?
5. How did you feel spending time with the animals here? Is it something you hope to do again in the future, either here or at another facility?

Identity

1. What do you think of when I say the word "environmentalist"? How would you define it?
2. Do you consider yourself to be an environmentalist? Why or why not? What has been your relationship to the environment throughout your lifetime, in what ways has it changed or stayed the same? In what ways do you interact with animals and the environment on a regular basis?
3. What kind of person do you think the tour guide was? Do you see them as an environmentalist? Why or why not? Do you think that they see themselves in the same way that you do? Why or why not?
4. Do you think this kind of experience can appeal to environmentalists and non-environmentalists alike? Why or why not?
5. Is this the kind of experience that fits in with your identity, or was it taking you a bit outside your normal comfort zone?

Values (for the environment, concepts or beliefs about desirable states or behaviors, guide behaviors)

How would you describe the value assigned by your tour guide to these animals as part of this tour? What about for the environment in general, beyond the animals at hand? Even if the guide didn't use explicit words to describe his/her environmental values, how would you describe them in your own words?

6. Did the values you saw in the tour resonate with you, or not? Were there any ways in which the program either reinforced or challenged your values system?
7. What kinds of values do you think that society should have for these animals? How does this relate to the way humans interact with the environment more broadly? Does seeing these animals and hearing their stories change the way you feel about how humans should treat/interact with animals and the broader environment?
8. Do you sometimes worry that your own needs are in conflict with the goal of preserving the earth?
9. Why do you care about the environment? What motivates you to feel compelled to value it in the way that you do?
10. Do you feel that it is in your self-interest to protect the environment? Why?
11. Do you think humans exist apart from nature, or as a part of it? Are there environmental limits to growth for human society?

Behavior

1. During the tour, did they ask you to take any actions to help this animal or the environment? If so, what? How did you react to these calls for actions? Was there anything said on the tour that inspired you to take action even if it wasn't an explicit call for action?
2. What are the most important things one can do for these animals in your opinion?
3. Do you personally do anything that you consider to be helpful to either these animals or to the environment at large? (Give money? Volunteer time/participate in advocacy?). Have your intentions to engage in these kinds of activities changed after you experienced this program? If so, have you acted on any of these intentions?
4. Is there any information about how you can help that you wished they would have included in the program?

Generally speaking, what do you think are some of the most important things that people can do to try to help the environment? What do you consider to be the most difficult behaviors to help the environment? How would you rate yourself on these behaviors and why?

5. What are some things you wish you did differently in regards to your behavior towards the environment, and why do you feel that you can't engage in these behaviors?
6. Do you feel a sense of obligation to take pro-environmental actions?
7. Do you see yourself making tradeoffs for the environment?
8. How would you characterize the connections between helping these animals and helping the environment as a whole?

Is there anything that I have not asked you about in regards to your values, thoughts, opinions, and attitudes towards the environment that you think I should have asked about?

Demographics:

Age, gender, race, political affiliation, educational attainment

Follow-up:

Would it be ok with you if I contact you if I have any more questions?

APPENDIX D: INTERVIEW GUIDE 2013

INTERVIEW:

I am interested in finding out how the program you attended at (field site) impacted you as an individual. To help develop a picture of your experiences and history with nature and animals, please look at these cards and organize them in a way that has significance for you, focusing on experiences that contributed to the development of your environmental values, worldview, and beliefs.

CARDS:

1. Spending time in the woods
2. Spending time on a farm
3. ~~Spending time in rural areas~~ (I eliminated #3 and #19 after pretesting, but because the cards were numbered, I removed those cards as opposed to re-numbering the whole set)
4. Watching a beloved natural place get developed/degraded
5. Hiking and/or Camping
6. Hunting and/or fishing
7. Learning about the environment in school
8. Visiting zoos, aquariums, other animal-centric facilities
9. Attending programs at zoos, aquariums, nature centers featuring animals
10. Participating in or witnessing others torture animals
11. Growing up with pets (domesticated, exotic, etc.)
12. Rescuing animals (wild or domestic)
13. Participating in boy/girl scouts (or other similar group)
14. Attending environmental events, demonstrations (like earth day)
15. Travelling
16. Going on an experiential nature tour (i.e. dolphin watch, guided hike)
17. Experiencing difficulty with eating animals
18. Experiencing unpleasant encounters with animals
19. ~~Attending multiple programs at this facility~~
20. Witnessing environmental abuse, pollution
21. Recycling
22. Reading a book about environmental issues
23. Working in an environmental profession
24. Seeing animals at the circus or in other entertainment shows
25. Feeding wild animals
26. Observing wild animals in the wild
27. Learning about the environment from a loved one/mentor
28. Volunteer work with environmental organizations
29. Attending summer camp
30. Watching nature programs on TV
31. OTHER (make your own card)

During/After the person chooses cards:

Can you explain why you organized the cards in this way? What experience are you thinking of that influenced your thinking? What is the significance of the cards you featured most prominently, can you explain those a bit more? Using these experiences, can you create a story for your relationship with animals and the environment? How have your thoughts and feelings changed over time?

After card-sorting portion:

THE TOUR:

- 1) What were some of your reactions and impressions of the program? Both positive and negative?
- 2) What did you learn on the program that was particularly relevant to you given your previous experiences, background, and identity? (how does it relate to the cards)
- 3) What messages do you think your tour guide hoped you would take away from the program? Were those the most important messages for you?
- 4) Did anything on the tour challenge your way of thinking?
- 5) Did anything on the tour reinforce your thinking?
- 6) Did anything on the tour change the way you feel about these topics?
(Questions 4, 5, 6 can be asked during any of the sections, if I want to bring the conversation back to the tour).
- 7) Have you been to similar programs in the past? How does this experience compare?
- 8) How did you feel spending time with the animals here?

VALUES:

- 9) Why do you think it's important for this facility to exist? What purpose does it serve? (already established y/n answer through survey)
- 10) What value does this facility have for humans?
- 11) What value does this facility have for the natural environment?
- 12) Why are these animals important to conserve? For you, for human society, for the environment at large (ask each separately)?

BELIEFS (section most likely to be cut in interest of time):

- 1) Do humans exist more apart from nature, or are they more part of it? Explain.
- 2) Are there environmental limits to growth for human society? Explain.
- 3) Do you think it is in your self-interest to protect these animals? Explain.
- 4) Do you sometimes worry that your own needs are in conflict with the goal of preserving these animals? Explain.

NORMS:

- 9) What do you think is our responsibility towards the environment?
- 10) What environmental issues are the most important ones, in your personal opinion?
- 11) Do you think the work of this organization helps to address larger environmental issues? Why or why not?
- 12) Do you feel a sense of responsibility to take pro-environmental actions in general?
- 13) What do you think one should be doing to help these animals?
- 14) Do you plan to respond in this way? Why or why not?
- 15) Do you feel like your behavior makes a difference for environmental conservation? What about these specific species?
- 16) Tell me about your levels of optimism/pessimism in regards to whether or not you think that this organization has the ability to make a serious difference in the conservation of these species.

BEHAVIOR

- 12) During the tour, did they ask you to take any actions to help this animal or the environment? If so, what? How did you react to these calls for action?
- 13) How do you feel about being asked to do things as part of this educational program?
- 14) Was there anything about the tour that inspired you to take action even if it wasn't explicitly stated by the tour guide?

- 15) What kinds of activities, if any, do you plan to engage in the future that are similar to this tour?
- 16) What are some of the most important things one could do for these animals, in your opinion?
- 17) Do you personally do anything you consider to be helpful or hurtful to these animals, here at the center or in the wild (ASK SEPARATELY)? If so, what?
- 18) Is there any information about how you can help that you wish they had included in the program?
- 19) How would you characterize the connections between helping these animals and helping the environment as a whole? Do you think that this organization makes a real impact in general environmental conservation?
- 20) What behaviors do you think are the most important ones that you could engage in to help the environment? How do you rate yourself on those behaviors?

WRAP UP

- 7) Is there anything I haven't asked you about regarding your values, thoughts, opinions, and attitudes towards the environment that you think I should have asked about?
- 8) If you could summarize the impact that this tour had on you in one sentence, what would that sentence be?
- 9) Would it be ok with you if I contact you if I have any more questions?

APPENDIX E: LEARNER SURVEY

Survey and Recruitment for participants at Carolina Tiger Rescue

My name is Susan Caplow, and I am a graduate student at the University of North Carolina at Chapel Hill. I am currently collecting data for my doctoral thesis project. The purpose of my study is to learn about the communication of values, beliefs, and behavioral expectations in live animal interpretive experiences such as this one.

As part of my fieldwork, I am conducting a survey of tour participants. Your time completing this survey before the tour will be of immense help to me and will help Carolina Tiger Rescue and other similar organizations improve their educational programs. This survey should take **approximately 5-10 minutes**; I will also ask you to complete a brief follow-up portion at the end of the tour. I am interested in your perspective; no wrong answers exist. Survey results will not be traceable to individual respondents.

In order to help me match your pre-tour survey with your post-tour survey, please write your initials here:

If you are willing to participate further, I would like to interview you individually at a later date to learn more about your thoughts, attitudes, opinions, and experiences regarding this tour and other environmental issues. As a way to thank you for your additional participation, **you will be entered into a drawing for a membership at Carolina Tiger Rescue**. If you would be willing to participate in this portion of the study, please print your contact information here:

Name: _____ Phone: _____

Email: _____ Zip

Code: _____

If you have questions or concerns about your rights as a participant in this research, you may contact the Institutional Review Board at the University of North Carolina at Chapel Hill, at 919-966-3113 or by email to IRB_subjects@unc.edu (Refer to Study # 12-1073). If you ever need to contact me, Susan Caplow, you can reach me at 612-578-8571, OR by email to scaplow@live.unc.edu

Thank you for helping me with this study!

SECTION 1: PREVIOUS EXPERIENCES

1. How many times have you visited this facility before today? (if none, enter zero) ____
2. How many people are in your party, including yourself? ____ adults ____ children
3. Did you organize this visit, or did someone else in your party?
____ I organized it
____ Someone else organized it
4. Why did you want to attend this program? Please circle one response.
 - a) I am generally curious about this place.
 - b) I wanted to share this place with someone else (children, friends, etc).
 - c) I have a specific interest in the species/topics covered in this program.
 - d) I have never done anything like this before.
 - e) I enjoy spending time with animals.
 - f) Someone else wanted me to come.
 - g) Other (please specify)_____
5. Have you visited any of the following places (not including this facility) in the last 2 years? Circle all that apply.

a) zoo	f) circus
b) aquarium	g) science center
c) nature center	h) botanical garden
d) state or national park	i) animal rescue
e) natural history museum	j) Other facility with environmental or animal theme (please specify facility): _____
6. Did you attend a guided education program/tour at any of these facilities? ____Y ____N. If yes, please place a star (*) next to the facilities listed in question 5 where you remember attending a program.

SECTION 2: ATTITUDES ABOUT ANIMALS

Listed below are 20 statements regarding the use of animals. Please indicate the extent to which you agree or disagree with each statement:

<u>Statement</u>	Strongly Disagree	Mildly Disagree	Undecided	Mildly Agree	Strongly Agree
It is morally wrong to hunt wild animals just for sport.					
I do not think that there is anything wrong with using animals in medical research.					
There should be extremely stiff penalties including jail sentences for people who participate in cockfighting.					
Wild animals, such as mink and raccoons, should not be trapped and their skins made into fur coats.					
There is nothing morally wrong with hunting wild animals for food.					
I think people who object to raising animals for meat are too sentimental.					
Much of the scientific research done with animals is unnecessary and cruel.					
I think it is perfectly acceptable for cattle and hogs to be raised for human consumption.					
Basically, humans have the right to use animals as we see fit.					
The slaughter of whales and dolphins should be immediately stopped even if it means some people will be put out of work.					
I sometimes get upset when I see wild animals in cages at zoos.					
In general I think that economic gain is more important than setting aside more land for wildlife.					
Too much fuss is made over the welfare of animals these days when there are many human problems that need to be solved.					
Breeding animals for their skins is a legitimate use of animals.					
Some aspects of biology can only be learned through dissecting preserved animals such as cats.					
Continued research with animals will be necessary if we are ever to conquer diseases such as cancer, heart disease, and AIDS.					
It is unethical to breed purebred dogs for pets when millions of dogs are killed in animal shelters each year.					
The production of inexpensive meat, eggs, and dairy products justifies maintaining animals under crowded conditions.					
The use of animals such as rabbits for testing the safety of cosmetics and household products is unnecessary and should be stopped.					
The use of animals in rodeos and circuses is cruel.					

SECTION 3: VALUES AND BELIEFS

Now I would like to get your opinion on a wide range of environmental issues. For each of the following statements please indicate the extent to which you agree or disagree.

<u>Statement</u>	Strongly Disagree	Mildly Disagree	Undecided	Mildly Agree	Strongly Agree
We are approaching the limit of the number of people the earth can support.					
Humans have the right to modify the natural environment to suit their needs.					
When humans interfere with nature, it often produces disastrous consequences.					
Human ingenuity will insure that we do NOT make the earth unlivable.					
Humans are severely abusing the environment.					
The earth has plenty of natural resources if we just learn how to develop them.					
Plants and animals have as much right as humans to exist.					
The balance of nature is strong enough to cope with the impacts of modern industrial nations.					
Despite our special abilities humans are still subject to the laws of nature.					
Human destruction of the natural environment has been greatly exaggerated.					
The earth has only limited room and resources.					
Humans were meant to rule over the rest of nature.					
The balance of nature is very delicate and easily upset.					
Humans will eventually learn enough about how nature works to be able to control it.					
If things continue on their present course, we will soon experience a major ecological disaster.					

Now, I would like to know more about your perceptions of specific environmental problems in your community and worldwide.

1. Please rate the seriousness of these six environmental problems **in your community** on a scale of 1 (not at all serious) to 4 (extremely serious).

	Not at all serious		Extremely serious	
				
Deforestation	1	2	3	4
Water pollution	1	2	3	4
Air pollution	1	2	3	4
Land pollution	1	2	3	4
Overpopulation	1	2	3	4
Global warming	1	2	3	4

2. Please rate the seriousness of these same six environmental problems **worldwide** on a scale of 1 (not at all serious) to 4 (extremely serious).

	Not at all serious		Extremely serious	
				
Deforestation	1	2	3	4
Water pollution	1	2	3	4
Air pollution	1	2	3	4
Land pollution	1	2	3	4
Overpopulation	1	2	3	4
Global warming	1	2	3	4

3. Please rate the extent to which you feel responsible for environmental problems **in your community** and **worldwide**.

	Not at all responsible		Extremely responsible	
				
Environmental problems in my community	1	2	3	4
Environmental problems worldwide	1	2	3	4

Please rate the importance of each of the following values as a **guiding principle in your life**, from -1 (opposed to my values), 0 (not important), to 7 (extremely important). Please try to vary your scores, and list only a few values as extremely important.

Values statements	Opposed to my values	Not Important	Extremely important
Social power: control over others, dominance	-1	0 1 2 3 4 5 6 7	7
Influential: having an impact on people and events	-1	0 1 2 3 4 5 6 7	7
Equality: equal opportunity for all	-1	0 1 2 3 4 5 6 7	7
Preventing pollution: protecting natural resources	-1	0 1 2 3 4 5 6 7	7
Helpful: working for the welfare of others	-1	0 1 2 3 4 5 6 7	7
Unity with nature: fitting into nature	-1	0 1 2 3 4 5 6 7	7
Wealth: material possessions, money	-1	0 1 2 3 4 5 6 7	7
A world at peace: free of war and conflict	-1	0 1 2 3 4 5 6 7	7
Protecting the environment: preserving nature	-1	0 1 2 3 4 5 6 7	7
Social justice: correcting injustice, care for the weak	-1	0 1 2 3 4 5 6 7	7
Authority: the right to lead or command	-1	0 1 2 3 4 5 6 7	7
Respecting the earth: harmony with other species	-1	0 1 2 3 4 5 6 7	7
Ambitious: hard-working, aspiring	-1	0 1 2 3 4 5 6 7	7

SECTION 4: DEMOGRAPHICS

Now I would like to know more about your background.

- | | |
|---|--|
| <ol style="list-style-type: none">1. What is your sex? M___ F ___2. In what year were you born? _____3. How many children do you have?
0 1 2 3 4 5 6+4. What is the highest level of education you have completed?
___ Less than high school graduate
___ High school graduate or equivalent
___ Some college
___ Associate's degree
___ Bachelor's degree
___ Master's degree
___ Doctoral degree
___ Professional degree (MD, JD, etc)
___ Other _____5. What is your ethnicity?
___ Hispanic or Latino
___ Not Hispanic or Latino6. Please specify your race (mark all that apply).
___ American Indian or Alaska Native
___ Asian
___ Black or African American
___ Native Hawaiian or other Pacific Islander
___ White
___ Other _____7. Which of the following best describes your political orientation?
___ Democrat
___ Republican
___ Libertarian
___ Green
___ Independent
___ Undecided
___ Other _____ | <ol style="list-style-type: none">8. Do you work or volunteer for an environmentally focused organization, agency, or business? Select all that apply.
___ Yes, work
___ Yes, volunteer
___ No, neither9. Which best describes your current employment situation?
___ Full-time (more than 30 hours per week)
___ Part-time
___ Home maker
___ Full-time Student
___ Retired
___ Disabled
___ Not currently employed
___ Other _____10. Which of the following best describes the area you live in?
___ Urban
___ Suburban
___ Rural11. Do you live in North Carolina?
___ Yes
___ No
If yes, how long have you lived here? ____years12. What was your total annual household income in 2012?
___ Less than \$10,000
___ \$10,000 to \$19,999
___ \$20,000 to \$29,999
___ \$30,000 to \$39,999
___ \$40,000 to \$49,999
___ \$50,000 to \$59,999
___ \$60,000 to \$69,999
___ \$70,000 to \$79,999
___ \$80,000 to \$89,999
___ \$90,000 to \$99,999
___ \$100,000 to \$149,999
___ \$150,000 or more |
|---|--|

APPENDIX F: FACEBOOK POSTS WITH EXAMPLES

	CTR	%	CTR example	DLC	%	DLC example	NCA	%	NCA example
animals (pictures, fun facts about animals at the center)	38	37%	The cats lounging on this hot muggy afternoon before the storm rolled through. 8.21.13	8	9%	7.6.13 #Olympic Lemur Gymnastics - Uneven Bars: Lemurs have strong feet that grip almost like their hands. #LemurGold; 8.3.12	25	27%	Animal of the Week - North American River Otters (8 photos) You "otter" check out these amazing animals! 7.22.13
events at center (benefits, tours, camps, anything on site)	14	14%	Middle school campers spent yesterday afternoon designing animal habitats and creating scaled models of their designs 7.11.13	20	21%	8.5.13 Come hear our conservation coordinator, Charlie Welch, talk about the exciting work we're doing in Madagascar AND take part in a twilight lemur walk. Don't forget that Duke employees receive \$5 off registration! 7.13.13	37	39%	8.4.13; Join us today & every #Friday this #summer for #shark programs & activities during our Fin-Filled Friday events - all free with admission! 6.21.13
Other ways to support them or the species (conservation behaviors, shopping other places, donations, etc.)	20	20%	The Great Human Race is a 5K walk/run to raise money for participating charities. Last year Carolina Tiger raised over 10,000! This year's race took place last Saturday. Stay tuned for the final results! 4.9.13	15	16%	April was sweet, but May is savory! Join us today and tomorrow at California Pizza Kitchen in the Streets at Southpoint in Durham for some yummy pizza. Bring the attached flyer and the lemurs receive 20% of your total bill! 5.7.13	5	5%	CONSERVATION WEDNESDAY: Headed back to school? Ditch plastic sandwich bags, plastic water bottles and paper lunch bags! Pack a no-waste lunch bag, by using reusable containers that help save money and the earth! Need ideas? 8.14.13
animal comings/goings (births, deaths, arrivals, departures, movement)	14	14%	Bobbi Caracal ~ 1995 - 2012 ~ (8 photos): We have lost Bobbi Caracal due to kidney failure and mammary cancer... 8.24.12	10	11%	Announcing Hiddleston (b.3/24) and Poots (b.3/27), the newest blue-eyed black lemur additions to the DLC! Make them feel welcome! 5.4.13	10	11%	More than three dozen sea turtles were loaded onto a USCG ANT Fort Macon motor lifeboat this morning, and are now bound for the warm waters of the Gulf Stream. Fingers - and flippers - crossed that the trip today is a success! 2.15.13

people at the center (volunteers, staff, interns)	5	5%	Congratulations to November's Volunteer of the Month, Animal Care volunteer, Heather B.! Heather has been a great help and brings such an energy and enthusiasm to Carolina Tiger. Even though in this picture, Kaela Tiger is more tired than impressed. 11.1.12	4	4%	Today we give thanks to all of our wonderful lemur keepers! It is the last day of National zookeeper appreciation week! The DLC could not run without all of the hard work these amazing people do on a daily basis! 7.27.13;	3	3%	A big thank you to our summer interns and all of their hard work!! 8.9.12
Research (on-site?)	0	0%	n/a	8	9%	Why some of the world's tiniest primates could help us understand the aging brain: [link] 8.19.13	3	3%	It's Turtle Tuesday! The Aquarium recently partnered with University of North Carolina Wilmington in a study that may help diamondback terrapins in North Carolina. 8.6.13
engaging with audience (asking for guesses for questions, reactions to things)	2	2%	We're at 8,550 likes right now! Who thinks we can get up to 10,000? Share Carolina Tiger with your friends and help spread the word about the plight of captive wild cats!...Nakobi Cougar is on the hunt for 10,000 Likes! 4.13.13	6	6%	Primate charades! Can you guess the form of locomotion and what part of Madagascar that this would be useful in? 8.8.13	4	4%	Have you ever found something at the beach or in your local waterway that you just can't identify? Send us a Facebook message with a photo, and we'll happily try our best to give you an answer! 6.6.13
other interesting events, information (FYI, random or relevant)	5	5%	NatGeo Wild's Animal Intervention show on RescueOne- former home of Roman, Reina, Roscoe, Camilla, Jericho, and Nakobi- starting NOW 10.9.12	14	15%	Great news out of the CITES meeting! Madagascar's rosewood and ebony given greater legal protection under international trade agreements. [link] 3.13.13	4	4%	Coastal Living Magazine named Pine Knoll Shores as one of the best beaches to travel to, including our Aquarium!! Have you been yet?! 8.10.12
anthropofun (cute pictures of animals with them talking or similar concept)	4	4%	Hi. I'm Gabe the caracal. How are you? I am enjoying the tall grass today. 7.30.12	9	10%	"What do you mean it is only Monday?!" [surprised lemur pic] 8.6.12	3	3%	Oh, man... It's Monday! YAWN! [otter pic] 7.22.13
TOTAL	102	100%		94			94		

APPENDIX G: FREE CODES FROM POST-PROGRAM SURVEY

This table contains examples of responses to “What are the three most important things you learned during your tour?”
Spelling and punctuation errors were left in the sentences as written by participants.

Code description	CTR example	DLC example	NCA example
Facts (animal biology, natural history, ecology)	some cats have pre-tensil tails; cougar being stronger than lions; Tigers spray to mark their territory; White tigers are only bengal; The jaw strength of a tiger	lorises are poisonous; Female dominance in most species; scent communication; how lemurs got to Madagascar; There are tiny mouse-like lemurs	octopus can die from boredom; shark fins vs. dolphin fins; Turtles eat bugs; jelly fish anatomy
ANTHROPOCENTRIC			
Egocentric	seeing a bobcat; Tigers are super cute; saw new animals	how cute lemurs are :-); Observe animals in their natural habitat	don't stick hands in tank ; seeing everything behind the scenes!
Anthropocentric thinking	Just because an animal looks cute doesnt mean it can[t] rip your face off...; Cougars' prone to attack humans; safety; It's dangerous to own exotic animals	Affection for lemurs so we care about them; similarities to humans	jobs at aquarium; career opportunities; turtle skeletons are more like our own than I knew; Be careful around sharks
Animal's value to humans	n/a	Role of lemurs in research that may help people; diabetes study; Research using lemurs may help with human medical advances	n/a
Education	The importance of education; Tour was very educational and well conducted and the organization has tremendously improved since my first encounter here; public education	n/a	Education; Educate children about the importance of environmental conservation

WILD ANIMALS/THE ENVIRONMENT				
Threats to animals in wild (endangerment, habitat loss, etc.)	population decrease in wild; loss of habitat; how products directly contribute to habitat loss ie palm oil; Human impact on habitat; habitat destruction/ fragmentation	lemur endangerment; lemurs are rapidly losing their natural habitat; That many species of lemurs are endangered; Lemurs natural habitat is being destroyed by humans	environmental hazards the Sea Turtles face prior/during and after laying eggs; sand castles can be barriers to sea turtles; these turtles are endangered; Lionfish are invasive species - example of why this is a problem	
General environmental threats	n/a	Rainforest disappearing in Madagascar; How much education of native Madagascar people can affect the environment; Risks to environment; About the geography and environmental challenges in Madagascar	how we impact the environment; impact of actions on environment; environmental concerns	
General environmental statements	n/a	What their environment in Madagascar was like; Madagascar environment information; Extent of loss of natural environment	environment (only 1 coded)	
Normative statements - conservation	importance of keeping wild animals "wild"; They are less likely to be found in the wild so captivity is good; need to be protected more; the need for everyone to become interested in the preservation of the animals; How important for natural habitats to remain	Further need to protect these species; That they need protection; need to preserve them; how important it is to protect lemurs; How habitats for these animals are necessary; important to help protect them	Can't believe people hunt otters; The importance of helping protect these animals and their ecosystems; importance of conservation; need to protect turtles; escape of species non-native, such as lionfish and need to control; Turtle ordinances are important to turtle survival	
Species diversity	how different the animals are; different varieties of cats	Different kinds of lemurs; The many different sub-species; 70-100 species of lemurs	Types of turtles; different species of local wildlife	

Animal's ecological significance	wild animals protect environment; importance as keys to ecosystem; Importance of Keystone Creatures and how little we hear about them in general; purpose of cats in the wild - keystone species; effect of animals on the environment	The impact they have on the environment; the fact that they are important for the environment; That lemurs are important to the ecosystem in Madagascar; why lemurs are important to the ecosystem; that lemurs are seed spreaders	n/a
General conservation	The percentage of carnivores in the wild vs. pets	lemur conservation; conservation efforts	preservation of the animals in their natural habitat; conservation
CAPTIVE/INDIVIDUAL ANIMALS			
Animal care (this facility)	it takes a lot of \$ and staff to care for rescued animals; You don't touch the animals at all; Animals need so much space and care; very expensive to build new fence	How they are cared for (food, shots, etc.) at the Center; How the animals are obtained; Diet requirements are varied; What lemurs need to live in an environment 9000 mi. from native habitat	How one cares for animals - what animals eat; work it takes to keep everything in balance; That turtles eat green brownies!; ways they are taken care of; How large animals are put into tank
Threats to animals in captivity	Majority of big cats kept as pets are declawed; "pet" trade in US is that abundant; no laws restricting ownership; cruelty that exists	Issues with animals held in captivity; These animals are not living in any way close to their natural habitat; Pet trade	if animals aren't fed nutritiously, they can become very stunted growth-wise; Turtles shells become soft when malnourished
Normative statements - animal welfare	Don't keep wild animals as pets; need for legislation to ban wild cats as pets; lions/tigers aren't pets; how cruel it is to declaw animals; people shouldn't own wild animals as pets; petting cubs as an attraction is harmful; wild animals are not pets; wild animals should not be handled or taken as a pet	lemurs are not good pets; these are not pets; lemurs should not be kept as pets;	don't keep them as pets; Dangers of having as pet (it is important to spread the word about dangers that lie in trying to make a wild animal a pet); Animals must be cared for by professionals ;turtles are not good for pets

Individuals/ populations at this center	history of animals; How many of the animals came from the entertainment industry; Where each one came from; why the animals ended up here; most/all of the animals were rescued; Lifespan - how many animals lives started out and how they are able to live in peace now	How the center knows the personalities of the animals; How Duke Lemurs are named	why animals here (only 1 coded)
OTHER			
Ways we can help (specific or general)	how I can help; That I can donate venison from my freezer; how to take care of abandon animals; how to help protect the animals; talk to congress re: private ownership; Ways to help conservation efforts; not to support "tiger cub encounters" tourist activities.	how to protect lemurs; Other opps for engagement (only two examples coded)	Info on how to reduce impact on turtles; how to identify and stay away from turtle nests; how to protect turtles by turning lites [sic] off; ways to help the turtles; don't leave trash on the beach; reducing impact; Pick up trash when I see one; fill sand holes
This organization's work	the volunteering done at this facility is amazing. without it, it wouldn't exist; what you do here; need to support facilities like this one; run by mostly volunteers; how important these types of facilities are in order to care for the Animal; The reason this facility exists; goals of CTR; animals are lucky to have places like this; this org is very important.	Duke has the largest group outside of Mad...; what the lemur center does; Importance/ value of Duke Lemur Center; how this facility is operated; more about the lemur center; Duke program is working to help local Madagascar people learn new/better agricultural methods to reduce deforestation; the magnitude of the duke lemur center.	volunteer programs for kids/youth; how the aquarium operates; How animals are protected/ acquired/ released by the aquarium; # of volunteers; that much goes into running an aquarium; great aquarium - and exhibits; how animals who are taken here (sea turtles) can be rehabilitated and taken back to the wild; About how important ALL aspects of this aquarium are

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