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Identities and Motives of Naturalist Development Program Attendees and Their Relation to Professional Careers

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IDENTITIES AND MOTIVES OF NATURALIST DEVELOPMENT PROGRAM

ATTENDEES AND THEIR RELATION TO PROFESSIONAL CAREERS

by

Jennifer Arin Mraz

Abstract of a Dissertation
Submitted to the Graduate School
of The University of Southern Mississippi
in Partial Fulfillment of the Requirements
for the Degree of Doctor of Philosophy

December 2015

ABSTRACT

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In recent years, there has been much concern over the decline of biologists who actually identify themselves to be naturalists, which negatively impacts the field of conservation and the study of biology as a whole. This could result in a decrease in individuals who participate in naturalist-like activities, such as informal environmental education and environmental volunteerism. The purpose of my study was to determine what discourse identities were held by naturalist development program participants, how these discourse identities related to their volunteer motives in environmental settings, and how discourse identity related to professional careers. I defined identity through the lens of discourse-identity, which describes a person's identity as being conveyed through that individual's communication and actions. I conducted individual interviews or used an online questionnaire to ask questions to naturalist development program attendees about their workshop experience, relationship with nature, volunteer motives and activities, as well as professional career or career aspiration. Volunteer motives were quantitatively measured in both types of program participants using the published Volunteer Motivation Questionnaire. Overall, I found that 100 study participants had six discourse identities: naturalist ($n = 27$), aspiring naturalist ($n = 32$), nature steward ($n = 5$), outreach volunteer ($n = 6$), casual nature observer ($n = 22$), and recreational nature user ($n = 8$). Naturalist

development programs should focus on developing more naturalist-like discourse identities in their participants to help encourage participation in naturalist activities. Volunteer motives were ranked by importance to participants in the following order: helping the environment, learning, user, project organization, values and esteem, social, and career. The majority of Master Naturalist Program study participants that stated a career were in non-STEM careers; however, the majority of individuals with a naturalist or aspiring naturalist discourse identity did have careers in STEM. The OUTSIDE NDP study participants all expressed their intention to pursue STEM careers. By focusing on hands-on outdoor professional development, the development of naturalist discourse identities, and on developing the volunteer motives that participants' value, more individuals could be retained to assist with naturalist activities.

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A Dissertation
Submitted to the Graduate School
and the Department of Biological Sciences
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CHAPTER I

INTRODUCTION

Problem Statement and Rationale

In recent years, there has been much concern over the decline of biologists who actually identify themselves to be naturalists (Futumya, 1998; Krupa, 2000; Schmidly, 2005), which negatively impacts the field of conservation and the study of biology as a whole (Schmidly, 2005; Wilcove & Eisner, 2000). Naturalists are those who study the various aspects of organisms and their environment with intrinsic excitement and fascination (Futumya, 1998; Schmidly, 2005). In today's world, Grant (2000) says, "to be a naturalist is to ask questions directly about organisms in nature and to seek answers wherever they are to be found (macroecology, population genetics, etc.), by whatever means are available (field experimentation, analysis of DNA, etc.)" (p. 5). Characteristics of a naturalist include having good communication skills and being a careful, descriptive observer (Krupa, 2000); these individuals often make the best teachers and communicators to the general public (Schmidly, 2005). They are also very knowledgeable of the ecology, identification, taxonomy/systematics, and life history of particular groups of organisms, and how they interact with the natural environment (Futumya, 1998; Krupa, 2000; Schmidly, 2005). Without careful observation and an understanding of natural history, scientific research efforts are hindered (Wilcove & Eisner, 2000). Knowledge of areas such as taxonomy and systematics is needed for anyone to effectively study organisms (Schmidly, 2005). Biodiversity studies cannot be conducted without researchers being experts in taxonomy (Cotterill & Foissner, 2010). Additionally, a lack of naturalist-related subjects can make it difficult to generalize

research results to other populations or systems (Futumya, 1998), and even recognize relationships and patterns within nature (Wilcove & Eisner, 2000).

The decline of individuals with a naturalist identity is attributed to people having less exposure to educational field experiences, the decreased offering of natural history centered courses (Krupa, 2000; Schmidly, 2005; Trombulak & Fleischner, 2007; Wilcove & Eisner, 2000) and the emphasis of natural history being used to focus on modeling or conceptual understanding rather than understanding organismal diversity (Futumya, 1998; Schmidly, 2005). Individuals' not thinking of themselves or identifying themselves as naturalists is especially problematic for the future of wildlife and natural resource management (Wilcove & Eisner, 2000), as well as conservation research and education because they are all highly dependent on individuals with natural history knowledge (Greene, 2005; Hayes, 2009). Particularly non-governmental conservation organizations (i.e. Sierra Club, Audubon Society, etc.) rely on volunteers to assist with outreach (Tung & Zinn, 2004), and identity is known to influence continued volunteerism (Gooch, 2003). If individuals do not identify themselves as being naturalists, they could be less likely to volunteer for environmental activities, or to pursue environmentally focused careers.

<div align="center">Purpose of Study</div>

Naturalist development can occur formally through higher education, but there are also many opportunities outside of academia to receive such development. Many states, including Louisiana and Mississippi have Master Naturalist Programs that have a similar structure and standardized certification requirements across states. Also, there are smaller-scale, less standardized programs with similar development objectives such as the Over, Under and Through: Students Informally Discover the Environment

(OUTSIDE) Naturalist Development Program (NDP) that puts on a workshop through the University of Southern Mississippi (USM). Both programs aim to increase public knowledge of local environments as well as assist local outreach activities by developing volunteers to be naturalists. Master Naturalist Programs focus on increasing content knowledge of participants and encouraging volunteerism, whereas the OUTSIDE NDP focuses on what participants need to do to gain more content knowledge and pedagogy in informal learning environments.

Continued interest in volunteering has been linked to identity (Gooch, 2003). Identity refers to how an individual wants to be viewed at a particular time and place as demonstrated by their actions and in the way they communicate (Gee, 2001). When individuals demonstrate a more naturalist-like identity, they are more likely to continue volunteering for environmental outreach (Gooch, 2003). However, little is known about what motivates individuals to volunteer for environmental outreach or conservation, because most studies focusing on motivation examine it for social psychology purposes (Bruyere & Rappe, 2007). Identity has also been linked to influencing future career aspirations and career retention in Science, Technology, Engineering, and Mathematics (STEM) fields when it comes to individuals possessing a scientific identity (Chemers, Zurbriggen, Syed, Goza, & Bearman, 2011). Individuals that identify as scientists have a higher probability of being retained in STEM careers (Hunter, Laursen & Seymour, 2007). In order to promote the education and retention of more naturalists, as well as the proper development of naturalist development programs, it is important to understand how an individual develops and maintains the identity of a naturalist. In order to begin understand of the development and maintenance of a naturalist identity, the identities of

naturalist development program attendees, their motivations behind environmental volunteering, as well as their relation to professional careers need to be determined. Therefore, the purpose of this study is to investigate the identity of individuals participating in naturalist development programs, and how those identities relate to their motivations for environmental volunteering and their professional career.

Research Questions

1. What are the discourse identities of those who attend naturalist development programs?

2. What motives do attendees have for participating in a naturalist development program and related environmental volunteer activities?

3. How do the naturalist development program attendees' discourse identities relate to their professional careers?

Limitations and Definitions

My study focused on individuals who attend specific naturalist development programs in the southeastern United States, so the results may not be generalizable to every naturalist development program conducted elsewhere. The nature of my study required me to primarily distill an individual's discourse identity from their responses on a questionnaire or through an interview. This is a potential limitation to my study because I cannot outright ask individuals their discourse identity, and it can be challenging to get individuals to elaborate on their answers or share everything pertinent during an interview or on a questionnaire. Also, when administering a paper or online questionnaire, there is always a chance that respondents will not understand or misinterpret a particular question, resulting in missing data. This was the case for a few

of my online questionnaire respondents, which made determining their discourse identity

more difficult. Additionally, some of my interviewees and online questionnaire

respondents elaborated on their answers to questions, whereas some did not elaborate

very much at all. This made determining discourse identities difficult when there were

not thorough answers given. Also, there are many perspectives on how identity is

developed and maintained in different settings. Some researchers believe that

categorizing identities and relating them to behaviors are not particularly useful unless

the relevancy and occurrence of those identities are investigated as well (Roth & Tobin,

2007). Even if I relate the discourse identities I find to when they are relevant, the

academic community may still undervalue my study because of its focus on categorizing

identities.

Definition of Terms

1. *Docent* – someone who volunteers to guide others around, typically a museum or
   zoo.
2. *Catchment Volunteering* – those who volunteer for activities such as local garden
   work, clean-up activities, or environmental monitoring for the betterment of the
   community in rural or urban settings.
3. *Ecological Identity* – how individuals are perceived by others in terms of their
   passion and love for nature and nature experiences.
4. *Environmentalism* – an ideology centered around care and protection of the
   environment for the sake of the organisms that live in nature.
5. *Functional Approach* – a psychological perspective focusing on the reasons why
   an individual carries out a particular behavior or has particular beliefs.

6. *Identity* – how an individual is seen by others based on their actions and their communication.

7. *Informal Education* – learning that occurs outside of a traditional classroom setting.

8. *Motivation* – the reasons behind why a person acts the way they do at a certain time and place.

9. *Natural History* – the study of nature primarily through observation.

10. *Nature Guide* – an individual who leads and instructs groups of people in natural settings.

11. *Naturalist* – those who study through careful observation the various aspects of organisms and their environment with intrinsic excitement and fascination, and have a wide range of biological knowledge of the various aspects of the environment.

12. *Environmental Stewardship* – using the environment in a responsible way, and protecting it by participating in conservation efforts and engaging in the practices of sustainable living.

13. *Volunteerism* – using individuals who donate their time to carry out particular activities.

CHAPTER II

REVIEW OF RELEVANT LITERATURE

Conceptual Framework

Identity

Identity as defined by Gee (2001) is, "the kind of person one is recognized as being, at a given time and place" (p. 99). For an individual to be recognized as a certain kind of person, observers of that individual have to rely on their prior experiences with humans in general (Gee, 2001; Goffman, 1959). These experiences serve as a frame of reference for how to classify an individual based on how they behave in particular settings. This is done for every individual in order for others to determine what to expect from that person, and how they themselves should act towards that person (Goffman, 1959). Gee (2001) describes a number of behaviors that, in combination, reveal a person's identity. This includes the particular way someone acts, communicates, dresses, their body language, how they use objects, as well as how someone conveys their beliefs, values and feelings. Taking these combinations into account, observers use their own personally-developed system of interpretation to recognize an identity (Goffman, 1959; Taylor, 1994). Using this type of information, the same identity can be perceived from multiple perspectives.

Identity can be perceived from four different perspectives described by Gee (2001): nature-identity, institution-identity, affinity-identity, and discourse-identity. Nature-identity is determined by natural forces outside of an individual's control, such as genetics in the case of identical twins or a congenital condition. Institution-identity is determined by authorities that are a part of institutions, such as a university or its Board

of Trustees that recognize an individual as a professor. Affinity-identity is determined by participation or allegiance to a particular group with shared interests, such as a political party or volunteer association. These first three perspectives are more traditional ways of interpreting identity (Gee, 2001; Taylor, 1994). In our modern age, identity is not just assigned due to nature, institutions or social organizations. Individuals now determine their own identity without being subjected to only possessing one they are assigned by these other forces. Discourse-identity is determined by how an individual is perceived when they interact with others such as recognizing someone as being charismatic or ill-behaved (Gee, 2001). Such interactions include verbal communication as well as physical actions. An individual is observed behaving and communicating in certain ways, and not others, which is information that is then used to recognize that person as having a particular identity (Gee, 2001; Goffman, 1959). Individuals that observe a particular person's discourse, then use their prior experiences with that person as well as other humans who have acted similarly, to determine the validity of the particular identity being expressed (Goffman, 1959). This internal validation helps to shape the overall impression an observer has of a particular person in a particular situation.

Individuals want to be recognized by others as a specific type of person (Gee, 2001). This recognition is the source of an individual's D-identity; without others viewing and regarding an individual in a rational way, an individual cannot be inferred as a particular kind of person (Gee, 2001; Goffman, 1959). Ultimately, it is up to that individual to maintain their desired identity if they wish others to continue to view them in a particular way (Gee, 2001). As explained by Gee (2001), this type of identity is conveyed to others through direct communication and actions. In this way, the identity of

an individual is constructed and reinforced through a social environment. An individual in a social setting expresses himself in hopes to convey a particular impression on those around him (Goffman, 1959). For example, if an individual wants to be perceived as a naturalist, they will convey this identity through behaviors and other specific discourse that signal to others that they are a naturalist. By gaining information about a particular person through personal interactions, another individual can then use this information to predict how that person acts currently and will act in the future (Goffman, 1959).

Gee's (2001) identity framework is the best fit for my study because it focuses on recognition of identity as conveyed through actions and discourse, rather than focusing on identity constructed or upheld by other means. This perspective allows me to exclude preconceived identities based on nature, institutions, and affinity groups. Instead, I am able to let the actions, attitudes, and words of my participants to reveal their identity. Also, I chose to use Gee's (2001) framework in my study because of the nature of my sample population. Naturalist development programs are open to anyone who would like to participate, so there are a range of participants with different backgrounds and varying levels of interest in nature. An alternative framework, science identity, as defined by Carlone and Johnson (2007), refers to an individual's competence, performance, and recognition in a scientific setting. Although this identity framework has a lot in common with Gee's (2001), it is not the best fit for my study because I am focusing on identity in an environmental setting, not simply a scientific setting. Alternatively, ecological identity as defined by Thomashow (1995), "refers to all the different ways people construe themselves in relationship to the earth as manifested in personality, values, actions, and sense of self" (p. 3). This identity framework is too specific for my study population

because it inherently requires individuals to be categorized according to their relationship to the earth. This would force individuals into identities that are not truly reflective of themselves. For example, some individuals could be primarily participating in a naturalist development program to learn pedagogy, not for any earth-related reason. In order to best understand the identities of my study population, my project is framed by Gee's (2001) D-identity. This framework focuses on understanding identity development through behavior and communication in any setting, and so does not unnecessarily limit the potential identities found in my study.

Motivation

There are many different reasons for why people volunteer. As I am investigating individuals' identities, it is important to understand why individuals are volunteering to serve as naturalists. An individual's motivation is related to their D-identity because the reasons behind their actions are a part of their identity. My study followed the functional approach in regards to motivation, first described by Katz (1960) in regards to attitudes, and later described by Clary and Snyder (1991) in regards to motivation. They define this type of approach as being, "concerned with the reasons and purposes that underlie and generate psychological phenomena—the personal and social needs, plans, goals, and functions being served by people's beliefs and their actions" (p. 123). Essentially, individuals exhibit the same actions to satisfy their own personal psychological functions (Clary et al., 1998). This can be applied to motivation: individuals take part in similar behaviors, but for varying motivational reasons (Houle, Sagarin, & Kaplan, 2005). Therefore, individuals will volunteer for a particular activity or event, but have different motivations behind their volunteering.

Using a functionalist approach, Clary et al. (1998) have defined six functional motives behind volunteerism: values, understanding, social, career, protective, and enhancement. Value motives indicate that an individual volunteers to help others. Understanding motives indicate that an individual volunteers to increase their content knowledge and abilities. Social motives indicate that an individual volunteers to meet, befriend, and/or continue friendship with others. Career motives indicate that an individual volunteers to participate in professional development. Protective motives indicate that an individual volunteers to avoid their own problems. Enhancement motives indicate that an individual volunteers to encourage personal growth.

Although these six motives have been used in many studies on motivation, they do not specifically address an outdoor setting (Bruyere & Rappe, 2007). Using the functional approach and the six motives described by Clary et al. (1998), Bruyere and Rappe (2007) identified seven volunteer motivation factors related to environmental volunteers: helping the environment, learning, social, values and esteem, project organization, career, and user. Helping the environment indicates individuals volunteer to better the outdoors in natural areas. Learning indicates individuals volunteer to learn more about nature. Social indicates individuals volunteer to meet other people with whom they have similar values and viewpoints, and to spend time with people they know. Values and esteem indicate individuals volunteer to feel better about themselves and to do something that conveys their values. Project organization indicates individuals volunteer for organizations or programs that exhibit good organization so they do not feel they are wasting their time. Career indicates individuals volunteer for work experience or exposure to new career options. Lastly, user indicates individuals volunteer because they

have a connection to where they volunteer, whether it is for leisure or work, and they want to see the area improved. I used the seven motives described by Bruyere and Rappe (2007) to frame the motivation portion of my study because they focus on individuals volunteering in outdoor settings.

<div align="center">Literature Review</div>

Informal Education

Teaching and learning are primarily thought of as occurring only in formal classrooms, but they also occur in informal learning environments. These environments include science centers such as zoos, aquariums, environmental centers, and museums, as well as the great outdoors. Many studies involving informal learning environments focus on their visitors, with little attention paid to those that staff these environments (Diamond et al., 1987; Johnston & Rennie, 1994). Docents, naturalists, and other types of informal educators are essential for facilitating learning in informal environments, as well as influencing the attitudes of their audience towards science (Johnston & Rennie, 1994; Krupa, 2000; Rennie & McClafferty, 1995; Schmidly, 2005). Because informal educators are interacting with the public in informal learning settings and therefore influencing how the public views science, in order to understand how they develop their professional identity, the professional development of such individuals needs to be well studied.

Some science centers have employed the use of explainers, which are staff ranging from students in high school to graduate school that are trained to help visitors understand exhibits and answer any questions (Diamond et al., 1987; Johnston & Rennie, 1994). These individuals aid visitors primarily in the understanding of exhibits by relating information to the outside world (Johnston & Rennie, 1994). Through the

experience of being an explainer, individuals were found to have developed their professional identity by their increased understanding of science, general interest in science, and curiosity of the world (Diamond et al., 1987). Other programs such as Master Gardener and Master Naturalist train individuals to be experts in a content area as well as encourage their participants to educate the public (Bonneau, Darville, Legg, Habberty, & Wilkins, 2009; Main, 2004; Van Den Berg et al., 2009). Because the individuals that participate in these programs purposefully apply and pay money (Mississippi Master Naturalist Program, 2015) to participate in many hours of naturalist development for the title of Master Naturalist (Boyd, 2009; Texas Master Naturalist Program, 2009), they are intrinsically motivated to do so most likely because they consider themselves to be some sort of naturalist. However, there has been an increase of post-secondary students that do not acknowledge they are naturalists (Futumya, 1996; Krupa, 2000; Schmidly, 2005), and it is unknown if this lack of a naturalist identity exists with individual that attend naturalist development programs.

An individual can be trained as a naturalist through formal schooling, but other opportunities exist through development programs such as Master Naturalist, Master Conservations or Watershed Stewards, Volunteer Naturalist Programs, (Larese-Casanova, 2011; Van Den Berg, 2006) or similar Conservation Stewards Programs (Van Den Berg, 2006). These programs, first in Florida and Texas but now occurring in other States, provide environmental education to adults on natural resources and their management to increase public knowledge and encourage volunteerism (Bonneau et al., 2009). To initially become certified, participants have 15 months to complete classroom and field instruction of at least 40 hours, advanced development of at least eight hours, and

volunteer hours of at least 40 hours (Guiney & Oberhauser, 2009; Texas Master Naturalist Program, 2009). To stay certified each year, typically participants must complete and submit volunteer hours of at least 40 hours, and take part in advanced development of at least eight hours.

These programs typically attract both amateur and professional naturalists regardless of the term 'master' in the name (Larese-Casanova, 2011; Main, 2004), and focus on building content knowledge and awareness of environmental issues (Larese-Casanova, 2011; Main, 2004; Main, 2006; Van Den Berg et al., 2011). They also focus on developing individuals as naturalists to hopefully encourage them to share their knowledge with others and participate in environmental education volunteerism. Studies involving Master Naturalist programs have focused on program assessment (Broun, 2007; Broun, Nilon, & Pierce II, 2009; Main, 2004; Larese-Casanva, 2011; Van Den Berg et al., 2011), gains in environmental content knowledge (Bonneau et al., 2009; Broun, 2007; Larese-Casanva, 2011; Main, 2004; Van Den Berg, 2006), changes in attitudes towards the environment (Bonneau et al., 2009; Van Den Berg, 2006), volunteer motivations for program participation (Bonneau et al., 2009; Broun et al., 2009), and the psychology behind participants' relationship with the outdoor world (Guiney & Oberhauser, 2009). There have been no studies on Master Naturalist programs involving identity.

Identity

Even though there is a declining number of individuals identifying themselves as naturalists (Futumya, 1996; Krupa, 2000; Schmidly, 2005), there is a lack of knowledge outlining what identities are present in individuals participating in naturalist activities

(Hayes-Conroy & Vanderbeck, 2005). Gooch (2003) examined the identity of catchment volunteers; those who volunteer for activities such as gardening work, clean up days, or monitoring of water quality for the betterment of the community in rural or urban settings. The majority of these volunteers had developed an ecological identity due to the personal ties they developed to the locations at which they volunteered and their shared values with other volunteers. Although Gooch (2003) examined identity of volunteers in a natural setting, these volunteers are different from naturalists because they are focused on improving the community in some way rather than natural history. Hayes-Conroy and Vanderbeck (2005) also looked at ecological identity, but focused on students enrolled in an eco-theology and environmental politics college courses that inherently provide many opportunities for reflection on the environment.

Both Gooch (2003) and Hayes-Conroy and Vanderbeck (2005) focused their ecological identity work on attitudes towards environmentalism and environmental issues. Evans, Ching, and Ballard (2012) took a different perspective by examining identity of nature guides with respect to the environment in which they volunteer, how they perceive themselves as nature guides, teaching groups of people to promote environmental stewardship, and learning about the environment. Identity was explicitly discussed in terms of how the nature guides perceive their role as an educator, whether it be for educating others with content knowledge, enabling participation in the outdoors, or getting others to share the responsibility of caring for the environment. The study by Evans et al. (2012) is similar to one aspect of my proposed study in that they examined identity in individuals who lead groups on educational nature hikes. However, Evans et al. (2012) limited their identity focus to the educator roles these nature guides serve to

others, rather than looking at what identities were held by these nature guides. Evans et al. (2012) also examined how a particular environmental setting, such as a national park, influenced identity, whereas I am relating identity to volunteer motives and professional careers. By not limiting the identity focus of my study to educator roles, one type of sample population, and by examining the motivations of the individuals to volunteer, I am able to determine more complete and informative identities of my study participants. This allowed me to explore in my study the relationship between identity, motivation, and retention in environmental volunteerism and careers.

In their study, Evans et al. (2012) found a link between identity and participation level in their nature guide program: individuals who did not develop the professional identity of a nature guide participated less in the program. The development of a professional identity has been shown to be important for retention of individuals in science (Chemers et al., 2011). However, there has not been a study relating identity of naturalists to careers and volunteerism. As long as there is a lack of individuals identifying themselves as naturalists, there will potentially be a decline of individuals pursuing careers related to natural history and conservation. To help in reversing this decline, more research is needed on how individuals develop and maintain a naturalist identity. Naturalists are essential in conservation efforts and education, which is becoming increasingly more important in today's world (Schmidly, 2005). Particularly for organizations that rely on volunteers, experiences that help promote the development as well as maintenance of an identity related to nature will help motivate continued volunteerism (Gooch, 2003).

Volunteerism

Volunteerism is particularly relevant for government and non-government organizations, as well as local communities that rely on volunteers to aid in restoration, maintenance, and educational outreach (Caissie & Halpenny, 2003; Donald, 1997; Measham & Barnett, 2008). Even though volunteerism has been studied extensively in health and social psychology fields, there has been a lack of research on areas involving environmental volunteerism (Bruyere & Rappe, 2007: Measham & Barnett, 2008). Environmental volunteerism is different from general volunteerism because volunteers learn new information through the process and their actions are more public (Bramston, Pretty, & Zammit, 2011). To further the understanding of volunteerism in environmental contexts, the motives individuals have behind volunteering are important to explore (Bruyere & Rappe, 2007; Measham & Barnett, 2008).

Across the different areas of volunteerism, more research has been advocated to shed light on what motivational patterns and experiences lead to individuals' developing volunteer motives (Clary, Snyder, & Stukas, 1996). To help facilitate the study of volunteer motives, Clary et al. (1998) developed the Volunteer Functions Inventory, which provides six functional motives behind an individual volunteering: values, understanding, social, career, protective, and enhancement. This instrument and questionnaires based on it have been used in many studies across multiple disciplines to examine the pattern of motivations behind volunteering in different contexts (Gage III & Thapa, 2012): i.e., why college students volunteer (Gage III & Thapa, 2012; Houle, Sagarin, & Kaplan, 2005; Papadakis, Griffin, & Frater, 2004), why individuals' volunteer for tree planting activities (Moskell, Allred, & Ferenz, 2010), why individuals volunteer

for Master Naturalist programs (Broun, 2007; Broun et al., 2009), and why individuals'

volunteer for national resource organizations (Bruyere & Rappe, 2007).

Bruyere and Rappe (2007) observed little research has been conducted on

volunteer motives in environmental settings. They helped address this gap by examining

volunteer motives in those belonging to different natural resource organizations. They

found the strongest motives for volunteering to be: (a) to help the environment; (b) to

help maintain spaces the volunteers use for recreation; (c) acting on their values; (d) to

gain more knowledge about the environment; and (e) to socialize with like-minded

people (Bruyere & Rappe, 2007). Since then, some studies have added to the literature on

volunteer motivations in natural settings. However, the majority of studies have focused

on individuals that volunteer for various environmentally-focused community restoration

projects such as removing non-native plant species, planting native vegetation, gardening,

maintaining or developing trails, tagging birds, controlling for erosion and monitoring

water quality (Asah et al., 2014). A number of studies have focused on examining the

motivations of community restoration volunteers: volunteer natural resource

organizations in Australia (Measham & Barnett, 2008), volunteers as a part of the Take

Care program in New Zealand (Cowie, 2010), urban forestry volunteers in New York

(Moskell et al., 2010), university students and active volunteers in local environmental

groups in Australia (Bramston et al., 2011), summer camp participants volunteering for

an environmental organization in Greece (Liarakou, Kostelou, & Gavrilakis, 2011), local

environmental volunteers in Hong Kong, China (Chuen, 2012), members of the Partners

for Native Plants project somewhere in the western United States (DiEnno & Thompson,

2013), volunteers at urban stewardship events in Portland, Oregon (Handleman, 2013),

and individuals participating in urban restoration events in the Seattle-Tacoma area (Asah & Blahna, 2012; Asah et al., 2014).

Besides the studies examining volunteer motives for community restoration projects, motives for individuals participating in Master Naturalist programs have recently been investigated. Broun (2007) and Broun et al. (2009) found that Missouri Master Naturalists primarily volunteered due to personal values and to learn more about the natural environment. Guiney and Oberhauser (2009) had Minnesota Master Naturalists rank reasons they volunteer, finding the most important reason to be to help nature. Additionally, one study focused on volunteers for the Florida Fish and Wildlife Conservation Commission, whose volunteer activities could have included maintenance of natural areas, monitoring of environmental quality or organisms and educating youth (Jacobsen, Carlton, & Monroe, 2012). This study also found the most important motivations for their volunteers were to help the environment and to learn more about nature.

Pilot Study

In spring 2014, I conducted a pilot study on OUTSIDE NDP workshop attendees. The purpose of my study was to investigate the discourse identities of individuals participating in naturalist development programs and how those discourse identities relate to their future career aspirations. I was able to interview 15 of the workshop attendees about their workshop and similar experiences, their relationship with nature, and their career aspirations. From the beginning, I recognized that sampling size was a limiting factor for my study.

I determined a total of 13 participants had a recreational nature user discourse identity because they only go outdoors into nature for recreational purposes, observe nature for aesthetic reasons, do not ask questions when in nature, and did not have much nature-related content knowledge. These 13 individuals were an atypical group for a naturalist development workshop. Only one person was a Biological Sciences major who wanted to go to medical school, one was a Marine Biology major, and the rest were from exercise science related fields, nursing, midwifery, psychology, photojournalism/advertising, and undeclared. Unsurprisingly, their career aspirations were non-naturalist-like careers, such as doctor, nurse, medical researcher, personal trainer, international banker, and photojournalist. As demonstrated by their career aspirations, the majority of these individuals' interests were anthropocentric, as opposed to environmentally related. Also, 11 of them only attended the workshop because it was required for their environmentally-themed Honors English course; another was required to attend because of their campus teaching job, and one attended for resume volunteer experience.

Overall, I found in this case that students' discourse identities were related to their career aspirations. This relationship is not entirely unexpected, as Chemers et al., (2011) states identity plays a key role in career decisions and retention in that career. This pilot study gave support for this relationship, but without looking at individuals from more than one naturalist development program, and having a small, atypical sample, the study is limited. Other research on naturalist development program attendees has found that a high percentage of individuals participate in volunteer activities that are nature-based once completing the program (Bonneau et al., 2009). Although motivations for nature-

based volunteerism have been examined in general in the literature (Bonneau et al., 2009), there has not been a study examining the discourse identity of such individuals and how it relates to volunteer motives and professional careers. Because my pilot study consisted of such an atypical group, my questions about what discourse identities naturalist development program attendees have and their relation to careers are still largely unanswered. Also, I recognized the importance of considering motivation along with discourse identity for attending naturalist development programs.

<center>Literature Gaps</center>

It has been recommended that science educators focus their research on identity development in informal settings (Bell et al., 2009). During the NARST 2014 symposium *Building a Compelling Case for Informal Science Education: Are We on the Right Track*, it was reported that identity of individuals in informal environments is one of the "buckets" still needing to be better explored by the informal science education community (Kanter et al., 2014). My study attempts to address part of this gap by looking at discourse identity of the individuals who would be facilitating learning in informal environments. The more naturalist-like identity you have, the more likely you are to continue volunteering for environmental activities (Gooch, 2003). Therefore, the more we know about the discourse identity of who chooses to attend naturalist development programs, the better researchers and educators can structure their workshops or programs to increase recruitment, development and retention of naturalists in environmental volunteerism and naturalist careers. Up until now, the identity of nature guides has only been loosely explored within one study by Evans et al. (2012). They only examined how nature guides perceive the environment, not what identities nature guides actually exhibit.

There has also been a lack of research on volunteer motivations in natural settings (Bruyere & Rappe, 2007; Measham & Barnett, 2008). Studies focusing on volunteer motivations have also been largely quantitative in nature (Asah et al., 2014), and have focused on individuals participating in community restoration projects or a few well-established Master Naturalist programs. To date, there are no studies on Master Naturalist programs in Mississippi or Louisiana, which have only established Master Naturalist programs in recent years. My study addresses literature gaps by focusing on discourse identity, volunteer motives, and professional careers of individuals in: (a) recently established Mississippi and Louisiana Master Naturalist programs, two states whose programs have not been studied; (b) the OUTSIDE NDP, a smaller-scale program which is primarily focused on developing individuals to educate others; and (c) by using quantitative and qualitative approaches to add depth to my findings. Overall, my study helps address the lack in identity and motivation research on naturalists.

CHAPTER III

METHODOLOGY

Procedure

My study employed mixed methods to examine the discourse identity of individuals who attend naturalist development programs, and how that discourse identity relates to their environmental volunteerism and professional careers. The naturalist development programs in my study are: (a) the OUTSIDE NDP; (b) the Louisiana Master Naturalist Program, Greater New Orleans Chapter (LA MNP); (c) the Mississippi Master Naturalist Program, Central Mississippi Chapter (CEMS MNP); and (d) the Mississippi Master Naturalist Program, Coastal Mississippi Chapter (COMS MNP). An Environmental Attitude Questionnaire (EAQ) and a Volunteer Motivations Questionnaire (VMQ) provided quantitative data, whereas field notes, video observations, open-ended questions on identity questionnaires, program applications, and individual interviews provided qualitative data. Using both a mixed methods approach adds support to my conclusions by allowing me to create rich descriptions of participants' discourse identities and volunteer motives while still being able to measure generalizable trends across a large sample (Patton, 2002). By using the VMQ, I revealed volunteer motives without having to primarily ask participants their motivations, which could bias their answers. During interviews or on open-ended questions of identity questionnaires, participants elaborated on these motives. The quantitative data from the EAQ, as well as the qualitative data from the field notes, video observations, and pre-interview identity questionnaire aided in data triangulation, adding support to my findings. A list of my

Table 1

Study purpose and research questions by data sources

Purpose: to investigate the identity of individuals participating in naturalist development programs, and how those identities relate to their motives for volunteering and their professional careers.

Research Questions	OUTSIDE Field Notes and Video Observations	OUTSIDE Identity Questionnaire	OUTSIDE Individual Interviews	EAQ	VMQ	LA MNP Application	MNP Online Questionnaire
1. What are the discourse identities of those who attend naturalist development programs?	S	S	P			S	P
2. What motives do attendees have for participating in a naturalist development program and related environmental volunteer activities?			S	S	P		S
3. How do the naturalist development program attendees' discourse identities relate to their professional careers?		S	P			S	P

Note: P = Primary data source; S = Secondary data source

Table 2

Data sources attributed to research questions

Research Question	Data Source	Questions/Task
1. What are the discourse identities of those who attend naturalist development programs?	OUTSIDE Field Notes & Video Recordings	All
	Pre-Interview OUTSIDE Questionnaire	# 1-8
	OUTSIDE Interviews	# 1-15
	LA MNP Application	# 1, 3-5, 11
	MNP Online Questionnaire	# 14-66
2. What motives do attendees have for participating in a naturalist development program and related environmental volunteer activities?	Pre-Interview OUTSIDE Questionnaire	#1
	OUTSIDE Interviews	# 1-2, 4-8
	EAQ	# 1-2, 4-7, 9-12, 14-17, 19-22, 24-28
	VMQ	# 1-31
	LA MNP Application	# 1, 3-5, 11
	MNP Online Questionnaire	# 14-18, 24-29, 67-97
3. How do the naturalist development program attendees' discourse identities relate to their professional careers?	Pre-Interview OUTSIDE Questionnaire	# 9
	OUTSIDE Interviews	# 16-17
	LA MNP Application	# 7
	MNP Online Questionnaire	# 7-8, 11-12

research questions along with the data sources I used to answer each question is listed in

Table 1 and Table 2.

Programs

Participants for my study were recruited from two types of programs held at four

different locations: OUTSIDE NDP, LA MNP, CEMS MNP, and COMS MNP. The

setting for each program type is described below.

OUTSIDE NDP. The OUTSIDE program was a National Science Foundation

grant-funded project at USM. This program held a free 1-1.5 day naturalist development

workshop once every fall and spring in 2013 and 2014. The workshop was available to

anyone over the age of 18 interested in attending. Many of the participants were

undergraduate and graduate students at USM majoring in Biological Sciences. However,

participants also included students of majors outside of Biological Sciences, faculty, and

members of the community. Participation in the workshop varied each semester: first

workshop had 28 participants, second workshop had 30 participants (21 new attendees

and 9 attendees that attended the previous workshop), third workshop had 46 participants

(33 new attendees and 13 attendees that had attended a previous workshop), and the

fourth workshop had 30 participants (15 new attendees and 15 attendees that had attended

a previous workshop). For my study, I recruited individuals that had attended one or more

of these workshops.

The first workshop was held in a typical classroom on the USM campus.

Subsequent workshops were held at the Lake Thoreau Environmental Center, which

consists of a building with a classroom and specimen rooms surrounded by ~131 acres of

wilderness with hiking trails. The goals of the workshop were for participants to: (a)

develop and demonstrate an understanding of scientific inquiry using process skills; (b)

develop and demonstrate an understanding of basic skills of studying natural history of

organisms; (c) develop and demonstrate an understanding of ways in which organisms

interact with each other and their environment; (d) develop an appreciation of the role

humans play in the environment by understanding the impacts of our actions; (e)

demonstrate an understanding of the pedagogical theories and practices appropriate for

middle school students; and (f) demonstrate an understanding of effective ways to incorporate iPad technology into environmental education.

The workshop consisted of presentations and group activities carried out by university biological sciences professors, instructors, graduate assistants, and a representative from the Mississippi Museum of Natural Science. These presentations included what makes someone a naturalist, how to use the location specific iPad app, local flora and fauna life histories, and general pedagogy (see Appendix A). Most of the workshop took place in an indoor classroom setting, but there was also one to two practice hikes around the lake where participants took turns leading different portions of the hike to practice the skills they had learned. This workshop is smaller in scale compared to MNPs, and although it covers some content like MNPs do, this workshop emphasized pedagogy rather than increasing content knowledge of its attendees.

During the semester that each of the first three workshops were held, workshop attendees had the opportunity to help lead two educational hikes at Lake Thoreau through the OUTSIDE program. These hikes gave the workshop attendees opportunities to practice what they had learned by acting as naturalists on two different nature hikes attended by underrepresented middle school students. Approximately 10-20 individuals have served as naturalists by leading an OUTSIDE sponsored hike post-workshop. During the semester of the last OUTSIDE workshop, OUTSIDE sponsored hikes were not offered due to lack of funding. Instead, that semester's and previous semester's workshop attendees' had the opportunity to participate in multiple outreach events at Lake Thoreau where they could act as naturalists. After the completion of the OUTSIDE

program, the university has continued offering naturalist development in the form of a docent program.

MNPs. Master Naturalist Programs are found in many states across the United States and focus on increasing natural resource and management tools of citizens to encourage environmental conservation (Boyd, 2009). Due to the willingness of the program directors, my study includes three programs: (a) the LA MNP; (b) the CEMS MNP; and (c) the COMS MNP.

The LA MNP began with a pilot study in fall 2012, whose participants were purposefully selected based on who could help the most with building the program by already being locally involved in service activities and/or could help with making an immediate impact on the area (A. Thomas, personal communication, February 6, 2015). Programs have since been held once every fall and spring with now just over 100 individuals on the current email list (B. Thomas, personal communication, December 1, 2014). The Mississippi MNPs began with pilot studies conducted from 1998 to 2003, with their first program held in summer 2008 (Boyd, 2009). Programs have since been held every summer in both locations with a total of 170 individuals on the current email list (E. Sparks, personal communication, May 19, 2015). These programs are open to anyone who fills out an application (see Appendix F for an example) and placement in the program is currently on a first come, first served basis.

In Louisiana and Mississippi, all MNPs have similar requirements to become a certified Master Naturalist and to maintain that status: (a) individuals must initially attend development sessions (54-81 hours for Louisiana and 40 for Mississippi) in areas of wildlife management as well as natural resource management; (b) they must then

complete a set number of volunteer hours (20 for Louisiana and 40 for Mississippi) within a certain amount of time, and maintain yearly certification; and (c) those individuals must also complete at least eight hours of advanced development within a certain amount of time, and then yearly to maintain certification (Louisiana Master Naturalist Program, 2015; Boyd, 2009).

Overall, across all programs, I had 112 participants responding to my recruitment efforts. Of that 112, only 100 participants had complete responses (29 OUTSIDE NDP, 27 LA NMP, 14 CEMS MNP, and 30 COMS MNP). Participants with incomplete responses were excluded from data analysis.

Data Collection Timeline

The data collection for my study took place during fall 2014 for the OUTSIDE NDP and spring 2015 for the MNPs. The OUTSIDE program held their last naturalist development workshop on a Friday afternoon and the following Saturday morning, during which I took field notes and video recordings. These served as a way to capture any behaviors relevant to the study that I could then ask my study participants about during their individual interviews. At the end of the workshop on Saturday, attendees filled out an open-ended identity questionnaire, the EAQ, the VMQ, as well as signed up for individual interview times. Also, past workshop participants that did not attend the last workshop were invited via email to sign up for an interview time; they then completed my questionnaires right before their individual interview. The open-ended identity questionnaire helped study participants to reflect on the experience, their relationship with nature, and what they think it means to be a naturalist before meeting me for an individual interview. Interviews were conducted within six weeks of the last

workshop. During spring 2015, an online questionnaire link was sent out on three

different occasions at the convenience of the program directors to the three different

MNPs. This online questionnaire consisted of demographics questions, an open-ended

identity questionnaire, the EAQ and the VMQ. Also, after I had collected the LA MNP

questionnaire responses I had permission to view the LA MNP applications to copy

relevant information to add to each study participants' questionnaire responses. Due to

availability and logistical constraints, application data for the CEMS MNP and COMS

MNP were not accessible. The timeline for my data collection is summarized in Table 3.

Table 3

Data collection timeline

Collection Method	Dates
Field notes & video recording during OUTSIDE workshop	September 19-20, 2014
EAQ, VMQ, & pre-interview identity questionnaire given to participants at end of workshop	September 20, 2014
Individual interviews of this year's workshop participants as well as past workshop participants; the VMQ & Identity questionnaire was given to those who have not taken it previously	September 22-November 7, 2014
SurveyMonkey questionnaire link open for LA MNP participants	January 6-29, 2015
Got LA MNP application data	February 6, 2015
SurveyMonkey questionnaire link open for COMS MNP participants	March 30-May 18, 2015
SurveyMonkey questionnaire link open for CEMS MNP participants	April 27-May 18, 2015

Quantitative Data Sources

   EAQ. The OUTSIDE workshop participants already completed the EAQ (see Appendix B) as part of data collection for the workshop, and it was also a part of the MNP online questionnaire. The EAQ was modified by Dr. Kristy Daniel, Dr. Aimee Thomas, Dr. Brian Gearity, and David Reider from the Civic Attitudes and Skills Questionnaire (CASQ) (Moely, Mercer, Ilustre, Miron, & McFarland, 2002). It contains 28 statements on a Likert-like scale and measures participants' attitudes towards five aspects: learning about environmental science, interest in nature, learning science, use of technology, and communication skills. Because my study does not focus on technology, I excluded the items on the use of technology aspect from my data analysis.

   This instrument is valid and reliable, with a Cronbach's alpha, a coefficient of internal consistency (Field, 2013), of 0.73 demonstrating reliability among the four aspects used in my study. In terms of validity, the instrument has face validity because it appears to measure what it was developed to measure (Field, 2013), and the wording of the items on the EAQ was only modified from the CASQ enough to make it relevant to attitudes towards the environment. It also has content validity because it appears to cover all aspects of the construct the instrument is meant to measure (Field, 2013), and because it was modified from the CASQ by construct experts. Validity is also present because the instrument was based on the reliable and valid CASQ (Moely et al., 2002).

   The EAQ attitude scores were used along with qualitative data described below to determine the volunteer motives of naturalist development program participants. How an individual feels towards learning about the environment, how interested they are in nature, how interested they are in learning science, and their attitude towards

communicating about science is related to their motivation to volunteer. The EAQ is

primarily used in my study for triangulation of sources (Patten, 2002). This adds

confidence to my conclusions by comparing results from multiple data sources (Patten,

2002).

      VMQ. To assess participants' motivations for volunteering, I had participants at

the end of the last OUTSIDE workshop complete the VMQ (see Appendix C), and it was

also a part of the MNP online questionnaire. This is an instrument developed by Bruyere

and Rappe (2007) and used to assess why individuals choose to volunteer in an

environmental setting. It includes 30 items on a Likert-like scale, with 3-7 questions each

devoted to addressing seven different volunteer motives: help the environment, learning,

social, values and esteem, project organization, career, and user (Bruyere & Rappe,

2007). Helping the environment indicates individuals volunteer to better the outdoors in

natural areas. Learning indicates individuals volunteer to learn more about nature. Social

indicates individuals volunteer to meet other people with whom they have similar values

and viewpoints, and to spend time with people they know. Values and esteem indicate

individuals volunteer to feel better about their self and to do something that conveys their

values. Project organization indicates individuals volunteer for organizations or programs

that exhibit good organization so they do not feel they are wasting their time. Career

indicates individuals volunteer for work experience or exposure to new career options.

Lastly, user indicates individuals volunteer because they have a connection to where they

volunteer, whether it is for leisure or work, and they want to see the area improved. The

VMQ is a valid and reliable instrument (Bruyere & Rappe, 2007). Validity was

established during the instrument development process and by basing the instrument on

the VFI, which has undergone extensive validity as well as reliability tests (CLAN WA Inc., 2004; Clary et al., 1998). Reliability was determined using principle component analysis with Cronbach's alphas of 0.68-0.95 for each of the seven volunteer motives on the questionnaire (Bruyere & Rappe, 2007).

Using the VMQ in my study allowed me to determine how the identities of participants are related to their motives for volunteering because identity can influence the likelihood of volunteerism (Gooch, 2003). It is important to know individuals' motivations for volunteering in order to increase the likelihood of them continuing to volunteer in the future. This is particularly relevant for government and non-government organizations, as well as local communities that rely on volunteers to aid in restoration, maintenance and educational outreach (Caissie & Halpenny, 2003; Donald, 1997; Measham & Barnett, 2008).

Qualitative Data Sources

Field notes and video observations. To gather data on how individuals acted during the workshop, I along with another senior member in my advisor's lab took field notes to determine workshop attendee's level of engagement, and supplemented the notes based off of video recordings of the participants. For example, I noted if participants were attentive to the presenters, if they took notes on the material, if they asked relevant questions, if they attempted to answer questions, if they were engaged in the group activities, and if they helped others understand the material. Video recordings of the workshop were made using two stationary video cameras positioned at the front of the classroom, oriented to capture the whole room of attendees. When the outdoor portions of the workshop occurred, the video cameras were left indoors, and I only captured

behaviors using field notes. The information from the field notes and video observations were used to inform my individual interviews with study participants. For example, if an attendee spent more time during the nature hikes looking around on their own rather than paying attention to the person leading the nature hike, this behavior was asked about during their individual interview.

Identity questionnaire. In order to assist with data triangulation, OUTSIDE NDP attendees completed a nine open-ended question identity questionnaire (see Appendix D) at the end of the workshop. This allowed attendees to reflect immediately on the workshop experience, as well as their relationship with nature. The questionnaire revealed why these individuals came to the workshop, what they liked and disliked about it, how they will use the information gained, if they plan to participate as a naturalist in future activities, how often they go out in nature, how they define a naturalist, if they consider themselves to be a naturalist, and what career they have or would like to have. This information was checked against what my OUTSIDE NDP study participants said during their individual interview with me, adding support to their statements and confidence to my assessment of their discourse identity.

Individual interviews. I conducted individual interviews with OUTSIDE NDP workshop attendees who had attended any of the four workshops held over the previous two years. Interviews were audio recorded, lasting ~15-60 minutes depending on how much each participant elaborated. Because I wanted to thoroughly explore the discourse identities of the OUTSIDE NDP attendees and give confidence to my categorization of individual's discourse identities, I interviewed as many attendees as possible. The interviews followed a semi-structured interview protocol (Patton, 2002), meaning the

interview was more like a conversation, with all questions getting asked to each

participant but not with the exact same wording or in the exact same order (see Appendix

E). The interview questions were similar to the questions on the identity questionnaire,

but allowed for elaboration on their questionnaire answers and probing when needed.

Once all interviews were completed, the audio files were transcribed in preparation for

analysis.

   LAMNP application. For the LA MNP, I was able to supplement the online

questionnaire responses described below with program application data (see Appendix F

for application) due to the willingness of the program director. The application consists of

11 similar questions that were asked to the OUTSIDE NDP interviewees, so I was able to

obtain permission to copy data from my study participant's program applications to

provide more information I could use to determine their identities (see Table 2 for

specific questions referenced). I was unable to access the program applications for the

Mississippi Master Naturalist Programs due to the program transitioning from one

program director to another.

   MNP online questionnaire. Although I was able to interview the OUTSIDE NDP,

this was logistically impossible with the MNP participants due to their geographical

spread across two states. Instead, I used SurveyMonkey to construct an online

questionnaire consisting of demographics questions, open-ended identity questions

similar to what was asked during OUTSIDE NDP interviews, the EAQ and the VMQ

(see Appendix G). In this way, I was able to obtain information about MNP participant's

program experiences, relationship with nature, volunteer activities, as well as current

career. Program directors were sent a preview link to approve the questionnaire in

advance, and once approved the live link to the questionnaire was sent to all individuals who had previously attended one of the programs or were about to begin a program (~100 LA MNP participants and ~170 MS MNP participants).

Researcher Qualifications

Prior to beginning my PhD program, I achieved a Master's Degree in Biological Sciences which trained me in the scientific process, designing a study and carrying it out to completion. Now I am using those skills, as well as others I have gained in further graduate study, to pursue a PhD in Biological Sciences with an emphasis in science education at USM. While in this program, I have completed multiple courses on research methods: Experimental Design (Quantitative Analysis I), Quantitative Analysis II, Mediation and Moderation, Survey Research Methods, Program Evaluation, Qualitative Educational Research Design, and Qualitative Educational Research Practicum. I have also assisted in data collection, analysis, and dissemination on multiple projects under the guidance of my doctoral research adviser, Dr. Kristy Daniel.

I have analyzed coded qualitative data and gave a poster presentation at the National Association of Biology Teachers Annual Conference on students' reflections on using the virtual environment Second Life. I have assisted with my adviser's Howard Hughes Medical Institute BioPhage project which involved determining the identities of undergraduates in an authentic research laboratory experience and how they relate to career aspirations. For this project, I transcribed interviews, coded the interviews, assisted in the development of the identities, and participated in the dissemination of the project by being first author on the project's manuscript currently under review. I have also assisted on my adviser's project OUTSIDE. While assisting with this project I have aided

in instrument development, data collection in the form of observation protocols, data collection in the form of conducting interviews, and data analysis through coding.

I also conducted a pilot study for this dissertation project where I determined the discourse identities of the spring 2014 OUTSIDE NDP participants and how they related to the individuals' career aspirations. This allowed me to test out my research methods by practicing field observations, developing an interview protocol, conducting interviews, transcribing the interviews, coding the transcripts, developing discourse identities, and writing up the results in the form of a conference proposal. Conducting this pilot study, as well as my participation in other projects and research methods courses at USM, has prepared me to carry out my proposed dissertation project.

<div align="center">Trustworthiness and Ethical Considerations</div>

The trustworthiness of results is achieved by addressing confirmability, credibility, dependability, and transferability (Lincoln & Guba, 1985). In order to increase the trustworthiness of my results, I used multiple methods. To enhance credibility, my research advisor, Dr. Kristy Daniel, as well as other members of my dissertation committee assessed my data collection methods to ensure they are appropriately rigorous for my study. My advisor and my dissertation committee member, Dr. Brian Gearity, are trained qualitative researchers who teach post-secondary level courses in research methods and have published multiple peer-reviewed articles in education fields. In order to enhance my own credibility as a researcher, I have taken multiple research methods courses involving both quantitative and qualitative research methods.

To ensure confirmability, credibility, and dependability, I used three types of triangulation. I used triangulation of sources (Patton, 2002) by comparing the results of: (a) the identity questionnaire and OUTSIDE interviews with my field notes, video observations and the EAQ; and (b) the LA MNP application with the Master Naturalist Program online questionnaire. I also utilized the expertise of my research advisor and senior laboratory members, who assisted in analyst triangulation (Patton, 2002). These individuals critiqued my coding processes and thematic development on multiple occasions as I worked through analyzing my data. I used the software NVivo 10 when coding my data, which captures the steps in my coding process in the form of a codebook that my research advisor critiqued. Dr. Daniel ensured the methodologies I employed were suitable for my data. She also made sure that the themes I developed have strong supporting evidence from my data. I also used methods triangulation (Patton, 2002) by pairing my quantitative data collected on my participants to confirm the results of my qualitative data. I also increased confirmability by comparing my findings to other findings in the literature in order to add support to the interpretation of my results.

To ensure transferability, I thoroughly described my participant pool within this dissertation to clearly communicate my study to others. The OUTSIDE Naturalist Development Workshop I sampled is unique to one university, and the Master Naturalist Programs I sampled are in the southeastern United States, but my results can provide insight into potential identities, motives, and relationships to professional careers other researchers could find in other types of naturalist-focused programs. Finally, I ensured transferability by including very detailed descriptions within my findings of the discourse identities my data reveal.

CHAPTER IV

ANALYSIS OF DATA

I have organized this chapter by my research questions. First, I describe my

qualitative and quantitative data analysis and results to address my first research question:

what discourse identities are held by naturalist development program attendees. Second, I

describe my quantitative and qualitative data analysis and results to address my second

research question: what motives do naturalist development program attendees have for

participating in a naturalist development program and volunteering in environmental

settings. Lastly, I describe my qualitative data analysis and results for my third research

question: how do naturalist development program attendee's discourse identities relate to

their professional careers.

Research Question One Analysis and Results

Data Analysis

Discourse identities of naturalist development program attendees were primarily

determined using transcripts of OUTSIDE NDP individual interviews and MNP online

questionnaire responses. There were 29 OUTSIDE NDP interview transcripts and 71

complete MNP online questionnaire responses (14 CEMS MNP, 30 COMS MNP, and 27

LA MNP); 24 LA MNP participants also had their relevant program application data

added to their online questionnaire responses. Additionally, 26 OUTSIDE NDP

interviewees had open-ended identity questionnaire responses that were checked against

their interview transcripts for data triangulation. I then uploaded the OUTSIDE NDP

interview transcripts and the MNP online questionnaire responses into the coding

program NVivo 10 for subsequent qualitative data analysis and used the same coding

process on all data.

I initially analyzed each interview using an inductive approach to code the

responses (Patton, 2002). For first cycle coding, I utilized descriptive coding to capture

participant responses on the online questionnaire and in the interview in the form of short

descriptive statements (codes) (Saldana, 2013). I then organized these codes in search of

overlapping data and grouped similar codes into categories eliminating redundancy. Next,

I used a deductive approach, using definitions from Grant (2000) and Futumya (1998) to

determine the overall themes within my data. I completed this by using an axial coding

approach to identify patterns across categories to derive themes that I reported as

discourse identities of participants (Saldana, 2013). When themes arose that did not fit

within the structured definitions, I reviewed by data a second time and used an inductive

approach to identify and define the new themes that emerged from the data. To ensure the

trustworthiness of my analysis, I used multiple raters to analyze the data to determine

inter-rater reliability (e.g., Halverson, Siegel, & Freyermuth, 2009). Two raters and

myself independently coded a subset of the data (20%) and then compared codes. We

discussed any potential discrepancies and updated the coding structure accordingly.

Once we became consistent in our coding and reached 100% inter-rater reliability, I

completed the remainder of the qualitative analysis as previously described seeking input

from the inter-raters as needed. I had all of the raters review the final codes and themes

upon completion of analysis to ensure accuracy. Overall, I identified six discourse

identities of naturalist development program attendees: *Naturalist, Aspiring Naturalist,*

Nature Steward, Outreach Volunteer, Casual Nature Observer, and *Recreational Nature*

User. Below, discourse identities are described from more naturalist-like to less

naturalist-like (Figure 1,) with a summary of the results in Table 4. General

demographics are listed in Table 5.
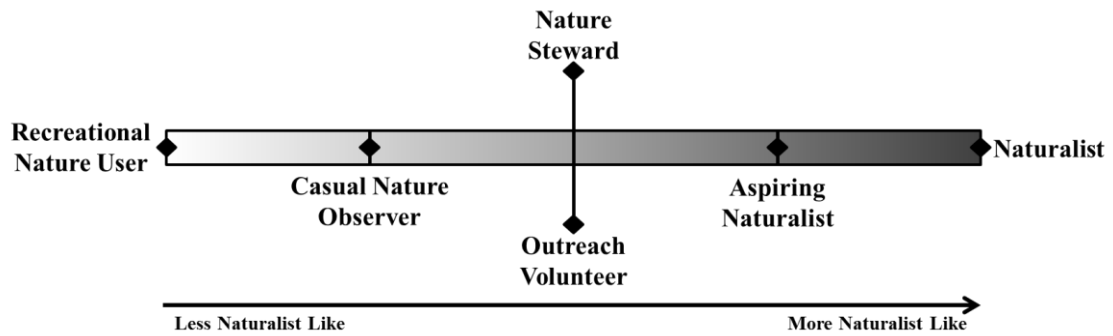
Figure 1. Categorical classifications of naturalist development program attendees'
discourse identities.

Table 4

Number of individuals with a particular discourse identity in each naturalist development program

| Program | Discourse Identity | | | | | | |
	Naturalist	Aspiring Naturalist	Nature Steward	Outreach Volunteer	Casual Nature Observer	Recreational Nature User	Total
OUTSIDE NDP	4	12	0	0	10	3	29
LA NMP	8	12	0	1	6	0	27
CEMS MNP	4	3	3	1	2	1	14
COMS MNP	11	5	2	4	4	4	30
Total	27	32	5	6	22	8	100

Table 5

Demographics of study participants

Demographic ($n = 100$)	Percentage
Gender	
Female	63%
Male	37%
Race	
African American	1%
Multiracial	1%
White	96%
Not Stated	2%
Age in Years	
18-30	32%
31-40	4%
41-50	7%
51-60	21%
61-70	23%
71-76	12%
Not Stated	1%
Year in School	
Freshman	8%
Sophomore	7%
Junior	4%
Senior	4%
Master's	5%
PhD	2%
Not Pursuing a Degree	70%

Results

Naturalist identity. Out of 100 individuals, 27 had a naturalist discourse identity. I found these individuals ask questions when observing nature, seek answers to their questions, and possess a large amount of broad nature content knowledge. When out in nature, Codie asks questions such as, "do I see any neat plants? Is there some sort of animal or bug I don't know?" He also describes that he seeks answers when needed,

stating, "[When I find something new], I'll go back and look it up or try to figure out what it is. And if I can't figure out what it is, I'll find a picture and send it to someone and be like, what is this?" Josh describes what he likes the most about being outside to be, "identifying the various species of plants and animals and learning those that I don't know." Like Codie and Josh, many individuals demonstrated asking questions when stating they spend their time in nature identifying organisms. Janis describes that she, "[carries] binoculars at most outdoor activities, [in] case I see something I can identify." Mia describes that she has, "been photographing marine birds, fish, and mammals in [my state] since 2010. I catalog the photographed species as an inventory of animals." In addition to asking questions when in nature, having a large amount of nature content knowledge also signifies a naturalist. Brian reveals his extensive nature knowledge, explaining, "I have a formal education in zoology, botany, and ecology; I have a great deal of professional training in marine, coastal, and terrestrial ecosystems being a PhD level marine biologist." Beatrice conveys her nature knowledge through examples in her local environment, such as,

> The call of the red shouldered hawks that nest in the forest behind my house…the barking tree frog that found his way onto my porch this spring. The indigo bunting that wandered back into my yard last week. The sunflowers in the fall and the pitcher plant blooms in the spring.

Also, I found these naturalist individuals conduct their own scientific studies on nature or assist in their data collection efforts, and/or avidly participate in environmental education activities, and/or avidly participate in conservation activities. A few of the individuals with a naturalist discourse identity described assisting in data collection for

various bird, tree, and habitat studies. A couple individuals describe specific natural history studies they are engaged in such as Jean who stated, "Some of the stuff I'm working on right now is…learning more about the species and its phenology of psychology. So learning about the timing of nesting in dusky salamanders, where they nest, how many eggs they lay." Jeremy mentions assisting with a bird study and a habitat study at a National Wildlife Refuge. Many of individuals with a naturalist discourse identity described volunteering for a variety of environmental education activities sponsored by museums, nature centers, zoos, schools, and nature-themed organizations such as the Audubon Society and Sierra Club. Jasmine describes that in addition to participating in bioblitz events, she also spends time out in nature doing, "birding, plant identification, amphibian surveys, plankton surveys, terrapin nest surveys, trapping and tracking." Some individuals described taking a lead role in educating others, through teaching natural history courses or workshops, as well as formally presenting information to others on topics such as butterfly gardens. Ellie describes, "I prepared and presented a PowerPoint presentation on [a nature center's] exhibit…[and] on using native plants, especially *Vaccinium* blueberries, in home landscapes." Some individuals also shared their participation in conservation related activities, such as habitat restoration, least tern nesting site protection and education, removal of invasive and non-native plants.

Aspiring naturalist identity. Out of 100 individuals, 32 had an aspiring naturalist discourse identity. I found these individuals sometimes ask questions when observing nature, sometimes seek answers to their questions, and have limited nature content knowledge but are committed to learning more. Kacey explains that when outside, "I'm looking at things and I'm thinking about things like why does this have this kind of

structure? Why is this behaving this way? It's like a laid back kind of puzzle to figure out." She use nature for relaxation as well as enjoys observing and learning while in nature. Camron describes, "whenever I go out on a boat with my Dad now I'll tell him all the names of all the fish that we catch…I don't know everything, I wish I did." When asked what he does when he comes across something new in nature, Camron says, "usually I ask about it and if no one else knows in the immediate vicinity then I'll, if it irks me enough, then I'll search for it on the internet or something and try to figure out what it is." He can identify some organisms, acknowledges he does not know all of them, and sometimes tries to identify organisms he does not already know. Heather also enjoys trying to identify organisms when out in nature, stating, "[I] walk around and see all the pretty flowers and pretty bugs. See what I can identify, what kinds are different. I have one of those little wildlife field guide things." Heather also describes her lack of content knowledge saying, "Being outside and being able to identify plants, trees, or animals, or insects, or stuff like that. I'm pretty limited with that unfortunately." Like many of the individuals who attended a naturalist development program, Jack did so to learn more about nature, saying, "Plant conservation is an ongoing interest of mine, specifically wetland restoration. An in-depth education on local flora/fauna will enhance my perspective on the subject." He actually self-reported as an aspiring naturalist, stating, "I view myself this way simply because there is still so much for me to learn." Like many with this identity, Jack acknowledges he has some nature knowledge but needs to learn more to consider himself a naturalist. Similarly, Cassidy conveys his willingness to continue learning about nature, saying, "I am interested in the things of nature, seek and

want to have more understanding of it." He enjoys observing plants and animals, and wants to keep acquiring nature knowledge.

Nature steward identity. Out of 100 individuals, 5 had a nature steward discourse identity. I found these individuals do not ask questions when observing nature or seek answers, have little nature content knowledge but want to learn more, and focus on activities that involve taking care of nature. Donna described why she wanted to participate in a naturalist development program, stating, "[I] need to know as much as possible about how, when, where and what I can do as an individual or as a group to regain some of the environmental areas that I loved and enjoyed as a child." Mallory likes to observe nature, but did not demonstrate asking questions or seeking answers, and uses very general terms when talking about organisms in nature, demonstrating her lack of nature knowledge. When asked what she does outside in nature, Mallory states,

> I rescued a brown earth snake from bird netting once and have relocated several venomous snakes from my yard. I was a pseudo-caretaker for a blind opossum. I feed the birds. I feed the deer and foxes around my house…and build habitats for toads.

However, Mallory does spend time caring for nature, and taken steps to learn more, stating, "I have educated myself when I had questions…I have protected nature." Leslie also describes taking care of animals, such as, "hummingbirds and bluebirds, I have so many at my home," and even refers to, "my flowers…my little frogs. What is not to love?" These individuals also described participating in outreach activities such as habitat clean ups and volunteering at nature centers.

Outreach volunteer identity. Out of 100 individuals, 6 had an outreach volunteer discourse identity. I found these individuals do not ask questions when observing nature or seek answers, have little nature content knowledge and do not actively pursue more knowledge, and focuses more on participating in activities to teach others. Brandy, like the others with this discourse identity, describes that she, "loves to watch birds and wildlife," but does not ask questions or seek answers in nature nor describe actively pursuing more knowledge. These individuals primarily describe volunteering to help out with events that in general involve teaching the public, such as through volunteering to help with school groups and summer camps. Yolanda in particular describes, "working with school groups to enhance their experience and appreciation" when helping with outreach events. Janie primarily focuses on giving, "presentations on honeybees to fifth graders, [and] talks about bee behavior at local bee clubs." May describes her volunteerism, "working at [a nature center] on children's activities." These individuals make volunteering to teach others a priority, but do not express the desire to actively seek more nature knowledge.

Casual nature observer identity. Out of 100 individuals, 22 had a casual nature observer discourse identity. I found these individuals do not ask questions when observing nature or seek answers, have little nature content knowledge, do not actively pursue more knowledge, and generally do not intimately interact with nature, only passively observing it when the opportunity arises. Felix states, "I spend most of my time inside in front of a computer…I go outside in nature to observe and relax. I like watching birds, reptiles, and mammals in their natural environments." Reese uses nature similarly, stating, "[when I'm stressed], I'll play music and just kind of relax and just ride around or

just look around and think." Similarly, Bernard says, "I occasionally walk around in nature as the opportunity presents itself because I do love it so." These individuals, as well as the others with this discourse identity, simply like observing nature when it is convenient for aesthetic reasons and relaxation. They do not ask questions or seek answers when in nature, and do not purposefully try to learn more when in nature. Some individuals also describe being uncomfortable being out in nature, such as Toni who said, "I'm not excessively comfortable in the environment. I kind of get squeamish." She, like a few others with this identity, avoid going out into nature unless it is necessary.

Recreational nature user identity. Out of 100 individuals, 8 had a recreational nature user discourse identity. I found these individuals do not ask questions when observing nature or seek answers, have very little nature content knowledge, do not actively pursue more knowledge, and likes the outdoors but mainly uses it for casual recreation. These individuals describe liking to observe nature when they happen to be in it, but primarily use the outdoors for its' stress-relieving aspects and recreational activities. Sawyer, when asked about his nature knowledge, says, "I don't know what anything is out there." He also describes going out into nature as, "it's just a nice break from staring at a textbook." When asked about what they do in nature, individuals with this discourse identity described taking part in activities such as biking, boating, camping, exercising, fishing, gardening, hiking, hunting, paddle sports, picnicking, socializing, and swimming. Susan states she goes outside because, "I enjoy the sunshine and fresh air," but does not attempt to learn more or really observe nature. Samantha describes going out into nature, "to find emotional and spiritual healing in nature settings." Patricia describes going outside because, "I like the sun. I don't like being cooped up inside all the time."

These individuals use nature for stress relief and the peacefulness it provides, as well as recreation.

Discourse identity versus self-reported identity. Of my 100 study participants, I identified 27 naturalists, 32 aspiring naturalists, five nature stewards, six outreach volunteers, 22 causal nature observers, and 8 recreational nature users. However, when I asked study participants whether or not they would consider themselves to be a naturalist, participants' answered differently (Table 6). Of my 100 study participants, 53 self-reported as naturalists, 38 self-reported as aspiring naturalists, eight self-reported as not naturalist-like, and one chose not to respond to the question.

Table 6

Number of participants' self-identified identities compared to discourse identities

Identity	Self-Reported Identity	Discourse Identity
Naturalist	53	27
Aspiring Naturalist	38	32
Not Naturalist-like*	8	41
No Response	1	0

Note: Asterisk (*) indicates identity includes nature stewards, outreach volunteers, casual nature observers, and recreational nature users.

Research Question Two Analysis and Results

Data Analysis

Motives for attending a NDP. The OUTSIDE NDP interviews as well the MNP online questionnaire included an open-ended question where participants could elaborate on why they decided to participate in their particular program and volunteer in general. The OUTSIDE NDP interview transcripts and the MNP online questionnaire responses

were coded similarly as described in the Research Question One Data Analysis section above: descriptive coding followed by axial coding to reveal motives for attending a naturalist development program.

Attitude towards nature and communication skills. I used study participants' EAQ responses to investigate their attitude towards topics related to naturalism and the environment. For each participant, I summed the scores of each of the 5-7 questions related to the four EAQ subcategories: learning about environmental science (questions 1, 6, 11, 16, and 28), interest in nature (questions 2, 10, 17, 20, 22, and 25), learning science (5, 7, 12, 15, 21, 26, and 27), and communication skills (4, 9, 14, 19, and 24). Questions 14, 16, 20, 26, and 27 were reverse coded before calculations were made because they questions were negatively worded. For the EAQ, I calculated a Cronbach's alpha of 0.78 using my sample data, confirming the reliability of the instrument. I then used IBM SPSS Statistics 20 software to perform multiple MANOVA's on these summed scores to determine the differences between attitude, programs, and discourse identities using the test statistic Pillai's trace (V) and an alpha level of 0.05. Due to sample sizes being very different between groups, the Hochberg's GT2 post-hoc test was also used to determine differences in the factors; this post-hoc performs separate univariate ANOVAs on the four EAQ subcategories to detect differences (Field, 2013). Box's test was used to determine homogeneity of covariance matrices with an alpha level of 0.005 (Huberty & Petoskey, 2000).

For the first MANOVA, I used program as my factor with four levels (OUTSIDE NDP, LA NMP, CEMS MNP, and COMS MNP), and my four outcome variables were the EAQ subcategories (learning about environmental science, interest in nature, learning

science, and communication skills). For the second MANOVA, I used discourse identity as my factor with six levels (naturalist, aspiring naturalist, nature steward, outreach volunteer, casual nature observer, and recreational nature user), and my four outcome variables were the EAQ subcategories (same as listed above).

Motives for volunteering in environmental settings. I used study participants' VMQ responses to investigate their motives for volunteering in environmental settings. For each study participant, I summed the scores of each of the 3-7 questions related to the seven VMQ subcategories: helping the environment (questions 1, 2, 5, 10, 11, 22, and 25), learning (questions 9, 12, 21, and 23), social (questions 3, 7, 14, and 26), values and esteem (questions 13, 16, 27, 30), project organization (8, 20, and 24), career (4, 6, 15, 17, and 29), and user (questions 18, 19, and 28). For the VMQ, I calculated a Cronbach's alpha of 0.90 using my sample data, confirming the reliability of the instrument. For each of my four participating programs, I determined the average summed score and standard deviation on each of the seven VMQ subcategories. I then converted these averages to percentages to rank the seven motives from most important to least important for each program and across all programs overall. I then used IBM SPSS Statistics 20 software to perform multiple MANOVA's to determine the differences between volunteer motives, programs, and discourse identities using the test statistic Pillai's trace (V) and the alpha level of 0.05. Due to sample sizes being very different between groups, the Hochberg's GT2 post-hoc test was also used to determine differences in the factors; this post-hoc performs separate univariate ANOVAs on the seven VMQ motives to detect differences (Field, 2013). Box's test was used to determine homogeneity of covariance matrices with an alpha level of 0.005 (Huberty & Petoskey, 2000).

For the first MANOVA, I used program as my factor with four levels (OUTSIDE NDP, LA NMP, CEMS MNP, and COMS MNP), and my seven outcome variables were the VMQ volunteer motives (helping the environment, learning, social, values and esteem, project organization, career, and user). For the second MANOVA, I used discourse identity as my factor with six levels (naturalist, aspiring naturalist, nature steward, outreach volunteer, casual nature observer, and recreational nature user), and my seven outcome variables were the VMQ volunteer motives (same as listed above).

Results

Motives for attending a NDP. My study participants attended naturalist development programs for a variety of reasons, many stating more than one motive (Table 7). The most frequently named motive was to learn more about the environment. I found approximately half of the participants who answered in this way were more specific, like Carla who stated, "I want to gain more knowledge about the flora and fauna in our area." Learning more about the local environment of their home region was a frequently reported motive. I found the second most frequently reported motive was to learn how to educate others about nature. Madison explains, "I am an elementary and middle school teacher who is eager to broaden my students' experience by enhancing my knowledge through experiences." I found the third most frequently stated motive was to learn how to conserve the environment. This is demonstrated by Melody, who said, "Living in a fragile area of [my state], I am committed to being educated about the fluctuating health of this area. My best defense against losing our land and wildlife is to be an informed and effective volunteer." Many individuals also mentioned wanting to learn more to help conserve the environment and to teach others to conserve as well.

Table 7

Study participants' reasons for attending naturalist development programs

Reason for Attending Program	Number of Participants OUTSIDE NDP ($n = 29$)	MNPs ($n = 71$)	Total ($n = 100$)
Learn how to conserve the environment[1]		21	21
To learn more about nature[2]	6	64	70
Learn how to educate others about nature	6	36	42
Likes doing outreach activities	9	4	13
Likes the area they would be volunteering[3]	4		4
Enjoys getting out in nature	5	3	8
Participate in an organized program with outdoor activities[4]		1	1
Similar to Master Gardener Program they are a part of		6	6
Enjoy nature with similarly minded people[5]		1	1
Helps with career or job[7]	1	6	7
Make contacts		9	9
Requirement for college teaching assistants	10		10
But still would have gone anyway	3		3
Needed volunteer hours for a course	12		12
But still would have gone anyway	11		1
Got to report hours for work credit	1		1

Note: Superscript numbers correspond to the volunteer motives on the VMQ. 1 = helping the environment, 2 = learning,

3 = user, 4 = project organization, 5 = values and esteem, 6 = social (none reported), and 7 = career.

Macy describes this, stating, "I want to preserve, protect and defend the unique natural beauty of [my state]. At this point, my interest is broader than my knowledge. I would like to expand my practical and technical knowledge to educate others." Felix spoke similarly, explaining, "I would like to learn more about the natural side of the state to be able to share it with others and to help preserve it for future generations." Participants conveyed other motives for attending a naturalist development program such as enjoying

taking part in outreach or other volunteer activities, like being outdoors, the program was helpful for a job or career, and allowed them to make contacts with organizations and other resources.

The majority of individuals that attended the OUTSIDE NDP reported they did so due to some sort of requirement (see Table 7). Ten workshop attendees said they attended because it was required of them due to being college teaching assistants (though three said they would have gone anyway), and 12 said they attended to receive credit for volunteer hours for a college course (though 11 said they would have gone anyway). Even though these requirements or benefits were reported as motives, approximately two-thirds of the participants reported the additional motives shown in Table 7.

Attitude towards nature and communication skills. Individually for each of my four participating programs and across all programs, the average summed score and standard deviation on each of the four EAQ subcategories are listed in Table 8. I found a significant effect of program on attitude ($V = 0.25$, $F(3, 96) = 2.15$, $p = 0.014$). However, when running this MANOVA, Box's test for homogeneity of covariance matrices was violated ($p < 0.001$), so these results and those that follow should be interpreted with caution. As shown in Table 9, I found that interest in nature ($F(3, 96) = 3.31$, $p = 0.023$) and learning science ($F(3, 96) = 3.16$, $p = 0.028$) differed significantly among programs, with the OUTSIDE NDP participants having a significantly higher attitude score towards learning science than the CEMS MNP participants ($p = 0.031$). For interest in nature, the Hochberg's GT2 post-hoc revealed non-significant differences ($p = 0.99 - 0.06$).

Individually, for each of my six discourse identities and across all discourse identities, the average summed score and standard deviation on each of the four EAQ

Table 8

Mean summed score and standard deviation on each of the four EAQ subcategories by program

EAQ Subcategory	Max Score Possible	OUTSIDE NDP (*n* = 29) Mean ± SD	LA NMP (*n* = 27) Mean ± SD	CEMS MNP (*n* = 14) Mean ± SD	COMS MNP (*n* = 30) Mean ± SD	(*n* = 100) Total Mean ± SD
Learning about environmental science	25	21.0 ± 1.2	20.9 ± 1.3	20.7 ± 2.5	20.3 ± 1.6	20.7 ± 1.6
Interest in nature	30	25.6 ± 1.4	25.9 ± 1.0	24.3 ± 2.6	24.8 ± 2.5	25.3 ± 2.0
Learning science	35	30.9 ± 1.9	29.6 ± 2.3	28.5 ± 3.2	29.5 ± 2.9	29.8 ± 2.6
Communication skills	25	21.1 ± 2.9	22.6 ± 3.4	22.0 ± 3.0	22.1 ± 3.2	21.9 ± 3.2

Table 9

MANOVA summary table for the effect of program on EAQ subcategory scores

Variable	Outcome Variable	Sum of Squares	df	Mean Square	F	p	η^2	Observed Power
Program	Learning about environmental science	7.229	3	2.410	0.907	0.441	0.00017	0.242
	Interest in nature	35.373	3	11.791	3.307	0.023*	0.00055	0.738
	Learning science	61.158	3	20.386	3.161	0.028*	0.00069	0.717
	Communication skills	30.967	3	10.322	1.037	0.380	0.00032	0.274

subcategories are listed in Table 10. I found a significant effect of discourse identity on

attitude ($V = 0.46$, $F(3, 96) = 2.42$, $p = 0.001$). However, when running this MANOVA,

Box's test for homogeneity of covariance matrices was violated ($p < 0.001$), so these

results and those that follow should be interpreted with caution. As shown in Table 11, I

found that learning about environmental science ($F(5, 94) = 4.61$, $p = 0.001$) and

communication skills ($F(5, 94) = 2.76$, $p = 0.023$) differed significantly among identities.

The nature stewards had a significantly lower attitude score towards learning about

environmental science than the naturalists ($p = 0.008$), aspiring naturalists ($p = 0.003$),

and casual nature observers ($p = 0.023$). I also found that aspiring naturalists had a

significantly higher attitude score towards learning about environmental science than the

recreational nature users ($p = 0.041$). For communication skills, the Hochberg's GT2

post-hoc revealed non-significant differences ($p = 1.00 - 0.06$).

    Motives for volunteering in environmental settings. Individually for each of my

four participating programs and across all programs, the average summed score and

standard deviation on each of the seven VMQ subcategories are listed in Table 12.

Across all programs overall, volunteer motives I found to be most important to least

important were: helping the environment, learning, user, project organization, values and

esteem, social, and career (Table 13). As Table 13 shows, the ranking of motives across

programs has some differences, and I found a significant effect of program on volunteer

motives ($V = 0.61$, $F(3, 96) = 3.37$, $p < 0.001$). However, when running this MANOVA,

Box's test for homogeneity of covariance matrices was violated ($p < 0.001$), so these

results and those that follow should be interpreted with caution. One motive that differed

significantly among programs was the career motive ($F(3, 96) = 20.08$, $p < 0.001$)(Table

Table 10

Mean summed score and standard deviation on each of the four EAQ subcategories by discourse identity

		Discourse Identity						
EAQ Subcategory	Max Score Possible	Naturalist (*n* = 27) Mean ± SD	Aspiring Naturalist (*n* = 32) Mean ± SD	Nature Steward (*n* = 5) Mean ± SD	Outreach Volunteer (*n* = 6) Mean ± SD	Casual Nature Observer (*n* = 22) Mean ± SD	Recreational Nature User (*n* = 8) Mean ± SD	Total Mean ± SD
Learning about environmental science	25	21.0 ± 1.2	21.2 ± 1.2	18.4 ± 2.6	20.3 ± 1.6	20.8 ± 1.5	19.4 ± 2.2	20.7 ± 1.6
Interest in nature	30	25.3 ± 2.0	25.7 ± 1.1	24.2 ± 2.2	26.7 ± 1.6	25.0 ± 2.1	24.0 ± 3.3	25.3 ± 2.0
Learning science	35	29.9 ± 2.4	30.7 ± 2.1	28.8 ± 2.6	30.7 ± 2.6	28.7 ± 2.8	28.5 ± 3.5	29.8 ± 2.6
Communication skills	25	22.7 ± 2.3	21.0 ± 3.6	22.2 ± 4.1	24.8 ± 0.4	22.2 ± 2.8	20.0 ± 3.7	21.9 ± 3.2

Table 11

MANOVA summary table for the effect of discourse identity on EAQ subcategory scores

Variable	Outcome Variable	Sum of Squares	df	Mean Square	F	p	η^2	Observed Power
Discourse identity	Learning about environmental science	51.604	5	10.321	4.608	0.001*	0.00119	0.967
	Interest in nature	37.516	5	7.503	2.073	0.076	0.00058	0.666
	Learning science	74.263	5	14.853	2.304	0.051	0.00083	0.720
	Communication skills	126.315	5	25.263	2.762	0.023*	0.00258	0.807

Table 12

Mean summed score and standard deviation on each of the seven VMQ subcategories by program

		Program				
		OUTSIDE NDP (*n* = 29)	LA NMP (*n* = 27)	CEMS MNP (*n* = 14)	COMS MNP (*n* = 30)	(*n* = 100)
VMQ Subcategory	Max Score Possible	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD	Total Mean ± SD
Helping the Environment	49	46.8 ± 3.1	46.8 ± 3.1	46.7 ± 4.6	44.2 ± 6.0	46.0 ± 4.5
Learning	28	25.6 ± 3.4	26.5 ± 1.8	26.4 ± 2.2	25.9 ± 2.8	26.1 ± 2.7
Social	28	22.0 ± 4.5	21.1 ± 4.1	22.3 ± 4.8	20.6 ± 3.9	21.4 ± 4.3
Values and Esteem	28	22.7 ± 4.2	21.7 ± 3.5	20.6 ± 4.9	20.5 ± 4.2	21.5 ± 4.2
Project Organization	21	17.3 ± 4.0	15.8 ± 3.8	16.7 ± 2.8	15.5 ± 3.3	16.3 ± 3.6
Career	35	29.5 ± 4.9	18.0 ± 9.8	14.5 ± 9.5	15.2 ± 7.8	20.0 ± 10.0
User	21	18.4 ± 2.9	18.1 ± 2.0	16.7 ± 3.8	16.5 ± 2.9	17.5 ± 2.9

Table 13

Volunteer motives ranked by importance within each program

Ranking	OUTSIDE NDP	LA NMP	CEMS MNP	COMS MNP	Across all Programs
1	Helping the environment	Helping the environment	Helping the environment	Learning	Helping the environment
2	Learning	Learning	Learning	Helping the environment	Learning
3	User	User	Social	User	User
4	Career*	Social		Project organization	Project organization
5	Project organization	Values and esteem	Project organization & User	Social	Values and esteem
6	Values and esteem	Project organization	Values and esteem	Values and esteem	Social
7	Social	Career	Career	Career	Career

Note: Motives ranked from most important to least important based on average summed scores. Project organization and user were equally important for CEMS MNP. Asterisks (*) denote

significant differences.

14). The OUTSIDE NDP participants regarded career to be more of a motive to volunteer than participants in all other programs ($p < 0.001$). Also, the user motive differed significantly among programs ($F(3, 96) = 2.93$, $p = 0.038$), but the Hochberg's GT2 post-hoc revealed non-significant differences ($p = 1.00 - 0.07$).

Individually for each of my six identities and across all discourse identities, the average summed score and standard deviation on each of the seven VMQ subcategories are listed in Table 15. Across all discourse identities overall, volunteer motives I found to be most important to least important were: helping the environment, learning, user, project organization, values and esteem, social, and career (Table 16). As Table 16 shows, the ranking of motives across discourse identities has some differences, and I found a significant effect of identity on volunteer motives ($V = 0.59$, $F(5, 94) = 1.76$, $p = 0.006$). However, when running this MANOVA, Box's test for homogeneity of covariance matrices was violated ($p < 0.001$), so these results and those that follow should be interpreted with caution. One motive that differed significantly among discourse identities was the helping the environment motive ($F(5, 94) = 3.27$, $p = 0.009$)(Table 17). The recreational nature users regarded helping the environment to be less of a motive to volunteer than naturalists ($p = 0.008$), aspiring naturalists ($p = 0.011$), outreach volunteer ($p = 0.015$), and casual nature observers ($p = 0.012$). The learning motive also differed significantly among discourse identities ($F(5, 94) = 2.57$, $p = 0.032$), with naturalists being more motivated to volunteer to learn than recreational nature users ($p = 0.021$). Also, the career motive differed significantly among programs ($F(5, 94) = 3.09$, $p = 0.013$), but the Hochberg's GT2 post-hoc revealed non-significant differences ($p = 1.00 - 0.06$).

Table 14

MANOVA summary table for the effect of program on VMQ subcategory scores

Variable	Outcome Variable	Sum of Squares	df	Mean Square	F	p	η^2	Observed Power
Program	Helping the environment	144.143	3	48.048	2.496	0.064	0.00065	0.602
	Learning	13.943	3	4.648	0.641	0.590	0.00020	0.180
	Social	43.149	3	14.383	0.789	0.503	0.00091	0.214
	Values and esteem	84.208	3	28.069	1.659	0.181	0.00176	0.423
	Project organization	56.963	3	18.988	1.471	0.227	0.00205	0.378
	Career	3811.518	3	1270.51	20.082	<0.001*	0.07647	1.000
	User	69.963	3	23.321	2.926	0.038*	0.00222	0.680

Note: Asterisks (*) denote significant differences.

Table 15

Mean summed score and standard deviation on each of the seven VMQ subcategories by discourse identity

		Discourse Identity						
VMQ Subcategory	Max Score Possible	Naturalist (*n* = 27) Mean ± SD	Aspiring Naturalist (*n = 32)* Mean ± SD	Nature Steward (*n = 5)* Mean ± SD	Outreach Volunteer (*n = 6)* Mean ± SD	Casual Nature Observer (*n = 22)* Mean ± SD	Recreational Nature User (*n = 8)* Mean ± SD	Total Mean ± SD
Helping the environment	49	46.5 ± 4.4	46.2 ± 3.3	46.2 ± 4.2	48.2 ± 1.6	46.5 ± 3.1	40.4 ± 9.0	46.0 ± 4.5
Learning	28	26.8 ± 1.3	26.3 ± 1.9	25.6 ± 3.4	27.0 ± 1.3	25.6 ± 3.7	23.4 ± 4.2	26.1 ± 2.7
Social	28	20.9 ± 4.0	20.1 ± 4.7	24.2 ± 4.1	22.8 ± 1.9	22.8 ± 3.8	20.4 ± 4.4	21.4 ± 4.3
Values and esteem	28	21.3 ± 4.7	21.0 ± 4.5	22.6 ± 4.5	21.0 ± 2.1	22.4 ± 3.8	21.1 ± 3.6	21.5 ± 4.2
Project organization	21	16.1 ± 2.7	15.2 ± 4.7	17.0 ± 4.1	16.7 ± 2.6	17.8 ± 2.7	16.4 ± 3.3	16.3 ± 3.6
Career	35	17.6 ± 9.8	21.7 ± 9.4	13.8 ± 9.3	10.0 ± 8.6	23.0 ± 9.6	24.5 ± 9.6	20.0 ± 10.0
User	21	17.5 ± 2.8	17.3 ± 2.9	17.4 ± 5.1	17.7 ± 2.4	17.7 ± 2.7	17.6 ± 3.1	17.5 ± 2.9

Table 16

Volunteer motives ranked by importance within each discourse identity

Ranking	Naturalist	Aspiring Naturalist	Nature Steward	Outreach Volunteer	Casual Nature Observer	Recreational Nature User	Across all Identities
1	Learning*	Helping the environment*	Helping the environment	Helping the environment*	Helping the environment*	User	Helping the environment*
2	Helping the environment*	Learning	Learning	Learning	Learning	Learning*	Learning*
3	User	User	Social	User	Project organization	Helping the environment*	User
4	Project organization	Values and esteem	User	Social	User	Project organization	Project organization
5	Values and esteem	Project organization	Project organization	Project organization	Social	Values and esteem	Values and esteem
6	Social	Social	Values and esteem	Values and esteem	Values and esteem	Social	Social
7	Career	Career	Career	Career	Career	Career	Career*

Note: Motives ranked from most important to least important based on average summed scores. Asterisks (*) denote significant differences.).

Table 17

MANOVA summary table for the effect of discourse identity on VMQ subcategory scores

Variable	Outcome Variable	Sum of Squares	df	Mean Square	F	*p*	η^2	Observed Power
Discourse identity	Helping the environment	294.828	5	58.966	3.266	0.009*	0.00138	0.876
	Learning	85.361	5	17.072	2.571	0.032*	0.00124	0.774
	Social	156.438	5	31.288	1.796	0.121	0.00329	0.593
	Values and esteem	34.489	5	6.898	0.387	0.856	0.00072	0.146
	Project organization	94.952	5	18.990	1.486	0.202	0.00342	0.501
	Career	1393.842	5	278.768	3.086	0.013*	0.02796	0.855
	User	1.859	5	0.372	0.042	0.999	0.00006	0.059

Note: Asterisks (*) denote significant differences.

When comparing discourse identity to self-reported identity volunteer motives, I found that there were some differences in motivation rankings from most important to least important: helping the environment, learning, user, project organization, social, values and esteem, and career (Table 18). Specifically, for those who self-identified as a naturalist, the social motive was ranked fourth, followed by values and esteem, project organization, and career. For those whose discourse identity was a naturalist, project organization was ranked fourth, followed by values and esteem, social, and career. When it came to those who self-identified as aspiring naturalists, project organization was ranked fourth followed by values and esteem. For those whose discourse identity was an aspiring naturalist, values and esteem were ranked fourth followed by project organization. For the individuals who self-reported as being not naturalist-like, their volunteer motives were ranked similarly to those who self-identified as naturalists, except project organization was ranked fifth and values and esteem was ranked sixth.

Table 18

Volunteer motives ranked by importance within each self-reported identity

Ranking	Naturalist	Aspiring Naturalist	Not Naturalist-Like	Across all Identities
1	Learning	Helping the environment	Helping the environment	Helping the environment
2	Helping the environment	Learning	Learning	Learning
3	User	User	User	User
4	Social	Project organization	Social	Project organization
5	Values and esteem	Values and esteem	Project organization	Social
6	Project organization	Social	Values and esteem	Values and esteem
7	Career	Career	Career	Career

Note: Motives ranked from most important to least important based on average summed scores.

Research Question Three Analysis and Results

Data Analysis

I grouped the careers of MNP participants by type into three major categories: STEM, non-STEM, and not stated. The same groupings were made for the career aspirations of the OUTSIDE NDP participants. I then did frequency counts of the number of individuals in each category.

Results

The majority of MNP participants who stated a career did not have a career in STEM (Table 19). Approximately 47% had non-STEM careers, 35% had STEM careers, and 18% did not state their career. Of those who stated careers, the discourse identity with the most individuals possessing STEM careers were naturalists (44%), followed by aspiring naturalists (32%), casual nature observers (12%), recreational nature users (8%), outreach volunteer (4%), and nature stewards (0%). When it came to non-STEM careers, aspiring naturalists had approximately the most (37%), followed by naturalists (27%), casual nature observers (21%), nature stewards (6%), recreational nature users (6%), and outreach volunteer (3%). When it came to the OUTSIDE NDP career aspirations, I found 100% of study participants wanted a career in STEM (Table 20).

Table 19

Number of MNP participants in STEM versus non-STEM careers within each discourse identity

	Discourse Identity of MNP Participants						
Type of Career of MNP Participants	Naturalist ($n = 23$)	Aspiring Naturalist ($n = 20$)	Nature Steward ($n = 5$)	Outreach Volunteer ($n = 6$)	Casual Nature Observer ($n = 12$)	Recreational Nature User ($n = 5$)	Total ($n = 71$)
STEM	11	8	0	1	3	2	25
Non-STEM	9	12	2	1	7	2	33
Not Stated	3	0	3	4	2	1	13

Table 20

Number of OUTSIDE NDP participants in STEM versus non-STEM careers within each discourse identity

	Discourse Identity of OUTSIDE NDP Participants						
Type of Career Aspiration of OUTSIDE NDP Participants	Naturalist ($n = 4$)	Aspiring Naturalist ($n = 12$)	Nature Steward ($n = 0$)	Outreach Volunteer ($n = 0$)	Casual Nature Observer ($n = 10$)	Recreational Nature User ($n = 3$)	Total ($n = 29$)
STEM	4	12	0	0	10	3	29
Non-STEM	0	0	0	0	0	0	0
Not Stated	0	0	0	0	0	0	0

CHAPTER V

SUMMARY

My project investigated the discourse identities, volunteer motives, and professional careers of naturalist development program attendees through semi-structured interviews, questions on an open-ended online questionnaire, the EAQ and the VMQ. These instruments allowed me to gain a better understanding of the relationship between discourse identity, volunteer motives, and professional careers. Other studies have found identity influences retention in STEM (Chemers et al., 2011) as well as interest in continuing to volunteer (Gooch, 2003). However, there is a lack of research on volunteer motives of individuals in environmental settings (Bruyere & Rappe, 2007) as well as identities (Hayes-Conroy & Vanderbeck, 2005). The remainder of this chapter is organized with respect to my research questions.

Discussion of Results

Identities of NDP Attendees

Futumya (1998), Krupa (2000), and Schmidly (2005) all spoke of the decline of biologists that identify themselves as naturalists. Using Grant's (2000) and Futumya's (1998) definitions of a naturalist, 27% of my study participants had a naturalist discourse identity and 32% had an aspiring naturalist discourse identity. However, 53% of my study participants self-reported as naturalists, and 38% self-reported as aspiring naturalists. Across all four NDPs I sampled, the majority of each sample was determined to have naturalist or aspiring naturalist discourse identities. This indicates many individuals that participate in naturalist development programs tend to see themselves as naturalist-like, whether they actually fit the definition of a naturalist. The individuals in

my study are not necessarily the demographic that Futumya (1998), Krupa (2000), and Schmidly (2005) spoke of as declining in self-identifying as naturalists. These individuals spoke specifically of individuals attending professional society meetings of naturalists, evolution, and systematic biologists (Futumya, 1998), as well as focused on individuals pursuing post-secondary education (Futumya, 1998; Krupa, 2000; Schmidly, 2005). My OUTSIDE NDP study participants tend to fit this demographic best, with over half of these participants possessing a naturalist or aspiring naturalist discourse identity. Additionally, only two out of my 29 study participants in this program did not self-report as a naturalist or aspiring naturalist. Although my sampling size is limited, this hints at individuals pursuing post-secondary education who have an interest in nature and conservation may tend to self-identify as naturalists.

As previously stated, 27% of my study participants had a naturalist discourse identity and 32% had an aspiring naturalist discourse identity. When it came to self-reporting, 53% of my study participants self-reported as naturalists, and 38% self-reported as aspiring naturalists. This large difference in discourse identity versus self-reported identity was due to many participants' definition of a naturalist. Participants tended to equate being a naturalist with merely caring about the environment and conservation, not recognizing that to be a naturalist they need to be asking questions when in nature, and have a large general knowledge of the various aspects of nature. Also, some participants viewed the identity of a naturalist as something that takes a lifetime to achieve, being hesitant to consider themselves to be a naturalist. This could indicate a lack of NDPs communicating to their participants what really makes someone a naturalist, including behaviors in nature as well as the type of knowledge they should

possess. Naturalist development program participants should be encouraged to consider themselves to be a naturalist if their discourse identity supports them possessing this identity.

Evans et al. (2012) examined identity in volunteer park nature guides, finding those who volunteered more viewed themselves as what a nature guide should be, whereas those who did not volunteer much did not see themselves as a nature guide. This study indicates the importance of identity in these types of settings. Although more individuals in my study self-reported as more naturalist-like than what was determined through discourse identity, this suggests that perceiving oneself as naturalist-like is an important aspect for continued development as a naturalist. This also has implications for continued volunteerism in environmental settings. If perceiving oneself as a nature guide leads to more volunteerism, perceiving oneself as a naturalist could also lead to more volunteerism.

The results of this study were quite different from my pilot study. The sample for my pilot study was predominately individuals who attended the workshop due to it being required for a post-secondary English course. Almost all of the pilot study participants had a recreational nature user discourse identity, whereas in this study the majority of participants had a naturalist or aspiring naturalist discourse identity. Although many of the OUTSIDE NDP participants in my study stated they attended the program due to a job requirement or a course volunteer hour requirement, I found the majority of this program's participants to have a naturalist or aspiring naturalist discourse identity.

Volunteer Motives of NDP Attendees

Across all programs overall, the most important to least important volunteer motives were helping the environment, learning, user, project organization, values and esteem, social, and career. For OUTSIDE NDP participants, career was a significantly higher motive than for participants in MNPs. This is likely due to almost all OUTSIDE NDP participants pursuing college degrees, whereas only one MNP participant in my study was pursuing a college degree. Many NDPs tend to have more participants that are women (Bonneau et al., 2009) and individuals older in age (Bonneau et al., 2009; Main, 2004; Van Den Berg, Dann, & Dirkx, 2009); this same trend was found in my MNP participants. Career motivations for participating in NDPs are typically low (Guiney & Oberhauser, 2009; Van Den Berg et al., 2009). However, my OUTSIDE NDP study participants were younger individuals (18-29 years old), so it was not surprising that this group had a significantly higher career motivation than my study's MNP groups due to career being an important motive for students (Bruyere & Rappe, 2007). I found it unsurprising that recreational nature users had a significantly lower motivation to volunteer to help the environment as well as to learn more about nature as these individuals use nature primarily for leisure activities rather than to better the environment or to learn more about it.

When it came to self-reported identity, volunteer motives did not vary all that much compared to those of the participant's discourse identities. Overall, the top three volunteer motives did not change whether participants were grouped by their discourse identity or self-reported identity. This implies that just by asking a NDP participant if they think of themselves as a naturalist, aspiring naturalist, or not naturalist-like would

reveal their top motives for volunteering in environmental settings. This information would be valuable to NDPs who would like to take into account participants' motives in order to encourage participation and retention in their particular program.

Bruyere and Rappe (2007) found the environmental volunteer motives of individuals who volunteered for natural resource organizations from most important to least important to be: helping the environment, user, values and esteem, learning, social, project organization, and career. In contrast to Bruyere and Rappe's (2007) study, my study participants were not as highly motivated to volunteer due to the connection to a specific natural space, or to act on their values. My study participants were more motivated to volunteer to learn new information. The most important volunteer motives of Missouri Master Naturalists were new learning experiences and altruism (Broun, 2009), and the most important volunteer motives of Texas Master Naturalists were to learn more about nature and concerned about nature within their community; however, the questionnaires used in these studies did not include questions about helping the environment and project organization, so they are not directly comparable to my study.

Relation of Identity to Professional Career

I found in this study that the majority of MNP individuals who reported a career were in non-STEM careers, which was not unsurprising. Master Naturalist Programs encourage participation from everyday citizens, regardless of their educational background (Bonneau et al., 2009; Broun, 2009; Main, 2004). Their primary motivations are to increase understanding of natural resources and their management, as well as encourage volunteerism (Broun, 2009; Louisiana Master Naturalist Program, 2015; Main, 2004; Texas Master Naturalist Program, 2009). Out of the individuals with non-STEM

careers, ~64% were naturalists or aspiring naturalists. Approximately 76% of the study participants having a STEM career were naturalists and aspiring naturalists. It would appear my study's programs were successful in attracting individuals interested in nature from various STEM and non-STEM backgrounds, which is ultimately the goal of such programs.

Chemers et al. (2011) found the development of a professional identity to be important for retention in science. However, when it came to MNP participants, their professional identity did not necessarily reflect their participation in the program because participants came from many non-STEM careers. A professional scientific identity also did not appear to determine whether or not study participants had a naturalist or aspiring naturalist discourse identity. This suggests that professional identity does not drive participation in programs such as MNPs. However, my OUTSIDE NDP study participants all stated they wanted a career in STEM. These were almost all individuals currently pursuing post-secondary education, or had recently graduated and had not yet found a full time job in their area of expertise. For these program participants, discourse identity did not play a role in whether or not participants intended to pursue a career in STEM.

Conclusions

Overall, the majority of participants in my study who attended a naturalist development program had naturalist or naturalist-like identities. This suggests that these programs do help facilitate the development of a naturalist identity. Because more individuals in my study self-reported they were a naturalist than what was revealed by discourse identity, this also suggests that naturalist development programs present the

idea of being a naturalist as something appealing for participants to strive towards. Naturalist development programs could help facilitate individuals developing the identity of a naturalist by emphasizing the important behaviors exhibited by them, such as those described by Grant (2000) and Futumya (1998) in their definitions of a naturalist.

The motivation of NDP participants to be considered a naturalist could also be linked to volunteerism. Gooch (2003) found identity affects continued volunteerism in catchment volunteers, and both Bonneau et al. (2009) and Main (2004) have found MNP participants continue to volunteer once completing the program. With additional research, such a relationship could possibly be established within my study's NDP participants. Additionally, more studies on NDPs should utilize motivation questionnaires specific to the environment, such as the VMQ developed by Bruyere and Rappe (2007), to gain a better understanding of the motivations for environmental volunteer motives. However, my study also showed how important it is to qualitatively assess volunteer motives as well because quantitative measures could miss some important motives. If participant's motives for volunteering in environmental settings were determined in advance, NDPs could tailor their programs to focus on these motives to increase program retention.

A naturalist identity was not just held by individuals in STEM fields, though individuals with a naturalist or naturalist-like discourse identity tended to have careers in STEM. However, the goal of naturalist development programs such as MNPs is to train the public, regardless of background, to be naturalist volunteers (Bonneau et al., 2009; Broun, 2009; Main, 2004). My study supports the idea that individuals who seek naturalist development programs are not merely motivated by career preparation, which aligns with the goals of MNPs.

Due to the increasing extinction rate of organisms as well as the decline in biodiversity and habitat loss, naturalists are more important than ever for ecological research (Krupa, 2000). More and more individuals are using public lands for recreational purposes, and luckily the number of volunteers in these areas has increased as well (Bruyere & Rappe, 2007). Because naturalists tend to be the individuals teaching others in informal learning environments like nature (Futumya, 1998), more individuals should be trained to have the discourse identity of a naturalist to encourage a more informed public as well as environmental volunteerism.

Future Directions

More identity research is needed in informal settings. It would be interesting to explore other naturalist development programs to see if they have the same discourse identities as what was found in my study, or if they differ regionally or by program type. Also, my study did not focus on what can help develop or maintain naturalist identities in these settings. Perhaps with a follow up questionnaire I could get feedback from study participants on what they think would help to encourage the development and maintenance of a naturalist discourse identity. About 41% of my study participants did not have a naturalist or naturalist-like discourse identity. Asking these participants about what they perceive to be factors affecting the development of naturalists would help shed light on what can help develop and maintain naturalist identities. Additionally, the number of my study participants who had a naturalist or aspiring naturalist discourse identity differed from the number of participants who self-reported as having a naturalist or naturalist-like identity. Because of this disparity, further research should be conducted

to determine which of these identities are more valuable for NDPs and environmental volunteerism.

I gathered information on the types of volunteer activities that my study participants have participated in, but I did not gather information about frequency or when these had taken place. There could be differences in the type of volunteer activities certain discourse identities participate in, the frequency of volunteering, or among program type. This would be useful to know for naturalist development programs depending on the types of outreach activities they try to promote (i.e. a program at a museum versus a program through a nature reserve). Volunteers' reasons for continuing to volunteer over time in environmental settings would also help shed light on how volunteers can be retained in naturalist development programs. As emphasized by Okun, Barr, and Herzog (1998), motivation studies need to continue to involve sampling more than one site, as well as not rely on small sample sizes.

In my study, the individuals that attended the OUTSIDE NDP were almost all pursuing college degrees, and all expressed their intent to stay in STEM. It would be interesting to track these individuals to see if they do in fact stay in STEM or if there are differences across discourse identities. I also collected data from the MNP participants about their college majors, so I could examine the relationship between major, identity, and career retention in STEM. Additionally, the decline in natural history course offerings at post-secondary institutions as well as a decline in field trips has been suggested as a contributing factor to the decline of naturalists (Futumya, 1998). It would be interesting to examine how many natural history courses and field trips NDP attendees have taken to see how these have impacted their development as naturalists.

APPENDIX A

TYPICAL OUTSIDE NATURALIST DEVELOPMENT WORKSHOP AGENDA

OUTSIDE

Lake Thoreau Environmental Center

Professional Development Workshop for
Naturalist Volunteers

_____

Friday, January 17, 2014

1:45 – 2:00 p.m.	Gather at LTEC 106
	Refreshments and mingling
2:00 – 3:00 p.m.	Administer pre-tests
	Introductions
	Overview of the PD Workshop (video)
	Learning Outcomes of OUTSIDE
	Drs. Kristy Halverson and Aimée K. Thomas, PI and Co-PI of OUTSIDE
3:00 – 3:30 p.m.	Research involvement of the naturalists
	Dr. Kristy Halverson
3:30 – 3:40 p.m.	Break
3:40 – 4:00 p.m.	What is a naturalist?
	Role of the naturalist in this project
	Dr. Aimée K. Thomas
4:00 – 5:00 p.m.	Using technology to teach OUTSIDE
	GO to Lake Thoreau App (Meet the Wildlife content)
	Marks McWhorter, OUTSIDE Lead Naturalist
5:00 – 5:15 p.m.	Break – Refreshments

5:15 – 7:00 p.m.	Hike utilizing GO to Lake Thoreau App (Explore the Plants content)
	Marks McWhorter, USM graduate student and Lead Naturalist

Saturday, January 18, 2014

8:45 – 9:00 a.m.	Gather at LTEC 106 – Breakfast snacks
9:00 – 10:15 a.m.	How to look at nature
	Flora and Fauna of LTEC (Explore the Plants content)
	Dr. Mike Davis, USM Botanist
10:15 – 10:30 a.m.	Break
10:30 – 12:00 p.m. (ISE)	Theoretical framework for teaching and Informal Science Education
	Learning theories, teaching strategies, 5E model, scientific inquiry
	Applying the 5E model
	Dr. Aimée K. Thomas, Crystie Baker, MS Museum of Natural Science Outreach Biologist, & Michael Sellers, USM Biology Instructor
12:00 – 1:00 p.m.	Lunch
1:00 – 2:30 p.m.	Theoretical framework cont.
2:30 – 2:45 p.m.	Break
2:45 – 4:45 p.m.	Practice hike utilizing GO to Lake Thoreau App (Explore the Plants content). All naturalists and researchers, led by Marks McWhorter, Carrie Jo Boyce and Jen Lamb
5:00 p.m.	Adjourn

APPENDIX B

ENVIRONMENTAL ATTITUDE QUESTIONNAIRE (EAQ)

Name: _____ Date: _____

Race: _____

Gender (circle one): Male or Female

Grade in school (circle one): Freshman   Sophomore   Junior   Senior   M.S.   Ph.D

Age: _____

Please answer the questions below as honestly as you can. Use the following scale to indicate your degree of agreement with each item. Do this by writing the appropriate number in the blank to the left of each statement.

_____

1	2	3	4	5
Strongly Disagree	Somewhat Disagree	Neither Disagree nor Agree	Somewhat Agree	Strongly Agree

_____

_____ I think that learning about nature is important.

_____ I do not like spending time outside in nature.

_____ I am comfortable with using technology (e.g., iPads and computers) on a regular

   basis.

_____ I can communicate well with other people.

_____ I think that scientific work is only useful to scientists.

_____ I think that it is not important to learn about different plants and animals.

_____ I think science is interesting.

_____ I think that using technology is distracting.

_____ I like communicating with other people.

_____ I think that I will be able to use what I learn about nature in my life.

1	2	3	4	5
Strongly Disagree	Somewhat Disagree	Neither Disagree nor Agree	Somewhat Agree	Strongly Agree

_____ I think it is important to learn about water conservation.

_____ I would like to learn more about science.

_____ I think using technology can help me learn science.

_____ I think communicating with other people is difficult.

_____ I think that science is useful to my life.

_____ I think that it is not important for me to learn about nature.

_____ I would like to learn more about nature.

_____ I think it is important for me to learn how to use technology.

_____ I think it is important to communicate with other people.

_____ I think that learning about nature will not impact my life.

_____ I think that learning about science is important.

_____ I think that working outside doing science activities is fun.

_____ I think that using technology is important.

_____ I like when other people communicate with me.

_____ I think that learning about nature can help the environment.

_____ I think that science is too hard for me to learn.

_____ I think that doing science activities is boring.

_____ I think that learning about science can help the environment.

APPEDNIX C

VOLUNTEER MOTIVATION QUESTIONNAIRE (VMQ)

There are many reasons why people volunteer. Please indicate the importance of each of these factors in explaining why you choose to volunteer.

	Strongly Unimportant		Neutral				Strongly Important
Concern for the environment	1	2	3	4	5	6	7
Protect natural areas from disappearing	1	2	3	4	5	6	7
See familiar faces	1	2	3	4	5	6	7
Explore possible career options	1	2	3	4	5	6	7
Do something for a cause that is important to me	1	2	3	4	5	6	7
Experience will look good on resume	1	2	3	4	5	6	7
Meet new people	1	2	3	4	5	6	7
Be part of a well-organized project	1	2	3	4	5	6	7
Learn about specific plants	1	2	3	4	5	6	7
See improvements to the environment	1	2	3	4	5	6	7
Ensure future of natural areas for my enjoyment	1	2	3	4	5	6	7
Observe Nature	1	2	3	4	5	6	7
Feel needed	1	2	3	4	5	6	7
Have fun	1	2	3	4	5	6	7
Get a foot in the door at a place where I would like to work	1	2	3	4	5	6	7
To express my values through my work	1	2	3	4	5	6	7
Make contacts that might help career	1	2	3	4	5	6	7
Allow me to work on an area where I visit	1	2	3	4	5	6	7
Enrich my future recreation experiences	1	2	3	4	5	6	7
Know what is expected of me	1	2	3	4	5	6	7
Learn about specific animals	1	2	3	4	5	6	7
Help restore natural areas	1	2	3	4	5	6	7
Learn about environment	1	2	3	4	5	6	7
Work with a good leader	1	2	3	4	5	6	7
Help preserve natural areas for future generations	1	2	3	4	5	6	7
Work with friends	1	2	3	4	5	6	7
Feel better about myself	1	2	3	4	5	6	7
Enhance the activities I enjoy doing	1	2	3	4	5	6	7
Help me succeed in chosen profession	1	2	3	4	5	6	7
To live closely to my values	1	2	3	4	5	6	7
It is a required activity	1	2	3	4	5	6	7

APPENDIX D

IDENTITY QUESTIONNAIRE

1. What is your primary reason for attending the naturalist development workshop?

2. What was your MOST favorite part of the workshop? Why? LEAST favorite? Why?

3. How do you plan to use the information you learned at the workshop?

4. Do you plan to help lead any of the naturalist activities held at Lake Thoreau this year? Why or why not?

5. What types of outdoor nature experiences have you had? Give examples.

6. How often do you have these types of experiences?

7. Describe an ideal naturalist.

8. Do you consider yourself to be a naturalist? Why or why not?

9. What career do you want to have (or currently have if not in school)? What interests you about that career?

APPENDIX E

SEMI-STRUCTURED INTERVIEW PROTOCOL

The following are representative questions of what will be asked during the interviews of the OUTSIDE program attendees.

1. What was your reason for attending the naturalist development workshop?
2. Have you ever had a similar experience to this workshop prior? If so, please describe.
3. What was your favorite/least favorite aspect of the workshop? Why?
4. What did you learn from the workshop? How do you plan on using that information?
5. Describe any experiences where you have taken part in an activity (like the hikes) described in the workshop.
6. Do you plan to help lead any of the field trips this semester? Why or why not?
7. Have you volunteered for any other nature-focused event or place? If so, please describe.
8. Do you plan to volunteer at any other nature-focused event or place? If so, please describe.
9. How often do you go outside in nature (refer to identity questionnaire)? Describe an experience.
10. What is your motivation for going outside? (Why do you go outside?)
11. What are your favorite/least favorite aspects of being outside? Why?
12. Describe an ideal naturalist.
13. In your opinion, what is the purpose for using a naturalist?
14. Do you consider yourself to be a naturalist? Why or why not?
15. Do you know of someone you would classify as a naturalist? Who? Why? Anyone else?
16. What type of career do you see yourself in after graduating? (if the participant is a student)
17. What interests you about that career?

APPENDIX F

LA MNP APPLICATION

**LOUISIANA MASTER NATURALISTS
OF GREATER NEW ORLEANS, INC.**
c/o New Orleans Botanical Gardens
1 Palm Drive, New Orleans, LA 70124
LaMasterNatGNO@gmail.com
www.louisianamasternaturalistgno.org

APPLICATION FOR COURSE ENROLLMENT
(WORKSHOPS & DATES ARE ON THE WEBSITE:
louisianamasternaturalistgno.com)

The primary purpose of the LOUSIANA MASTER NATURALIST PROGRAM (LMNP) is to offer a statewide program that educates Louisiana citizens about their precious flora and fauna, as well as other aspects of their environment and ecosystems. Once certified, the certified Louisiana Master Naturalists are required to use their talents to educate others or assist programs that promote and protect Louisiana's natural heritage.

Name: _____

Address: _____

_____

City: _____ State: _____ Zip: _____

Phone: Day: _____ Night: _____

Email: _____

I AM APPLYING FOR THE FOLLOWING COURSE: FALL _____ SPRING _____ ALL UPCOMING _____
We allow you to select since Spring courses are taught on weekends and Fall courses are taught on Fridays.

Acceptance into the Louisiana Master Naturalist Program is based on your interest and qualifications. Training will be limited to 25 or so individuals per course. If more than 25 applicants meet the qualifications for acceptance into the program, then individuals will generally be accepted on a first-come-first-served basis.
Upon acceptance into the program you will be required to pay a $250.00 course fee (DO NOT SEND PAYMENT WITH THIS APPLICATION) that covers the cost of training materials and related costs. Once certified, you will be offered a $25 refund (for those not completing certification, this money will be placed in a scholarship fund), and you will receive one year's paid membership valued at $25. NO REFUNDS WILL BE MADE FOR ANY REASON WITHIN ONE MONTH OF COMMENCEMENT OF THE COURSE AND/OR DURING THE COURSE.

Trainees are required to attend a minimum of 8 of the 10 training workshops (plus the introductory and final/closure workshops) and score 80% or better on the final exam.

Topics to be covered during training may include:
- Orientation & Introduction to the LMNP
- Ecological Concepts
- Ecological Regions of Louisiana
- Ecosystem Management
- Geology & Soils of Louisiana
- Nature and Naming
- Plants
- Ornithology
- Entomology, Spiders & other invertebrates

- Herpetology & Ichthyology
- Mammalogy
- Archeology
- Forest Ecology & Management
- Urban Forestry
- Volunteer Opportunities
- Graduation (family is welcome to attend)

NOTE: These topics will be folded into a curriculum appropriate for the required training program.

Upon graduation, I agree to give 20 hours of volunteer service through the Louisiana Master Naturalist Program. I understand that this volunteer service may be performed in any venue that enhances the public understanding of

Rev: 12-10-13

1 of 6

**LOUISIANA MASTER NATURALISTS
OF GREATER NEW ORLEANS, INC.**
c/o New Orleans Botanical Gardens
1 Palm Drive, New Orleans, LA 70124
LaMasterNatGNO@gmail.com
www.louisianamasternaturalistgno.org

Louisiana's natural heritage, subject to the approval of the LMNP Volunteer Committee. I also understand that I have to complete 8 hours of continuing education in the field of natural history. Annual membership dues of $25 are also required. Satisfying these requirements results in certification as a Louisiana Master Naturalist.

The title "Louisiana Master Naturalist" is not to be used for any commercial purposes and your name badge earned at the end of the educational course can only be worn at approved programs.

My signature is verification that I have read the above guidelines and that I am willing to abide by them.

Signature: _____   Date: _____

APPLICATIONS MAY BE SUBMITTED AT ANY TIME, BUT DATE OF RECEIPT IS AN IMPORTANT CRITERION FOR SELECTION.

MAIL COMPLETED APPLICATIONS TO: OR   **SCANNED AND EMAILED TO:**

Louisiana Master Naturalists of Greater New   LaMasterNatGNO@gmail.com
Orleans, Inc.
c/o New Orleans Botanical Gardens, 1 Palm
Drive, New Orleans, Louisiana 70124

QUESTIONS? LaMasterNatGNO@gmail.com

EXPERIENCE AND INTERESTS: Please be specific in providing all of the following information.

1. Why do you want to become a certified Louisiana Master Naturalist?

_____
_____
_____
_____
_____

2. In what areas of natural history and/or the environment/conservation are you especially interested?

_____
_____
_____
_____
_____
_____

3. Please list some of your hobbies or talents, including natural history or otherwise.

_____
_____
_____
_____
_____

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4. Please list any civic, natural history, or other groups in which you are or have been a member, and any office held or activity you participated in while a member of the organization (add a sheet if necessary).

Group	Office Held or Activity	Years

5. Please list any other volunteer work you have done (add a sheet if necessary).

For Whom	Type of work	Years

6. Please list skills that you possess which could be used to strengthen our LMN program (example: writing, editing, public speaking, coordination or management of other volunteers, woodcraft, electronics, graphic design, computer word processing, data entry or web page maintenance, etc).

_____

_____

7. What is your current and/or recent occupation(s)?

_____

8. What days and times are you <u>available</u> for Master Naturalist activities? Please check all that apply, depending on other obligations, of course.

	MON	TUE	WED	THR	FRI	SAT	SUN
Morning							
Afternoon							
Evening							

Comments on days/times:

_____

_____

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9. Please indicate by circling your level of interest in working with the following types of people.

	Interested			
	Not	Somewhat	Very	Extremely
Children - preschool or elementary age	1	2	3	4
Youth - junior or senior high age	1	2	3	4
Adults	1	2	3	4
Senior citizens	1	2	3	4
Physically impaired	1	2	3	4
Mentally challenged	1	2	3	4
Limited income	1	2	3	4
Other (specify)	1	2	3	4

10. Please indicate your level of interest in the following by circling the appropriate number. Keep in mind that you will be trained for specific tasks, if needed.

	Interested			
	Not	Somewhat	Very	Extremely
Urban Forestry	1	2	3	4
Coastal Restoration	1	2	3	4
Bird Counts	1	2	3	4
Reptile & Amphibian Counts	1	2	3	4
Fisheries programs	1	2	3	4
Educational presentations to groups	1	2	3	4
Ecosystem restoration - tree or grass plantings, etc.	1	2	3	4
Writing articles, newsletters, etc.	1	2	3	4
Planning future LMNP programs	1	2	3	4
Manning LMNP displays	1	2	3	4
Creating LMNP displays	1	2	3	4
Answering telephone, email, etc. questions	1	2	3	4
Assisting Coordinator in administering the LMNP	1	2	3	4
Working in LMNP Office (filing, copying, etc.)	1	2	3	4
Community service projects	1	2	3	4
Fund-raising concessions at activities	1	2	3	4
Coordinating LMNP projects	1	2	3	4
Other (specify)	1	2	3	4

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11. Please provide any other information about yourself that may help us select you for admission to the Louisiana Master Naturalist Program training.

_____

_____

_____

_____

_____

BACKGROUND CHECK
LMNGNO will certify that you are qualified to work with the public
VOLUNTEER CODE OF CONDUCT

Volunteers are expected to uphold high standards that ensure the safety and well-being of the LMNP, LSU AgCenter, or other LMNP affiliates, their staffs, volunteers, and clients. Volunteers will uphold all individuals' rights to dignity, self-development and self-direction. Volunteers will accept supervision and support from LMNP or Extension professionals while involved in the program. Volunteers will accept the responsibility to positively represent the LMNP and it affiliates during the tenure and duration of their volunteer engagement. Volunteers will conduct themselves in a courteous, caring, responsible manner with focus on respect, trustworthiness, fairness, and good citizenship. Volunteers are expected to respect, adhere to and enforce the rules, policies and guidelines set forth by the LMNP and its affiliates

and any programs to which they are specifically assigned. Volunteers should not commit unlawful acts and are expected to comply with equal opportunity and antidiscrimination laws. Volunteers will operate machinery, vehicles and other equipment, when applicable, in a responsible and safe manner. Volunteers are charged with performing their duties in a responsible and timely manner.

I have read, understand and will abide by the Volunteer Code of Conduct. I certify that the information set forth in my application is true and accurate, and I authorize the LMNP and/or its affiliates to verify the information.

Your signature X_____   **Date**_____

LMNP's primary sponsor, The LSU AgCenter, is a statewide campus of the LSU System and provides equal opportunities in programs and employment. Thank you for your interest in the Louisiana Master Naturalist Program!

WHEN WILL YOU BE NOTIFIED?

Applicants who are selected for the Fall or Spring Courses will be notified as soon as the class is full. _Watch your email for notification and instructions._

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Those on the waiting list will be notified soon thereafter, and we hope another course will interest you. We are keeping the group to about 25 people, so we unfortunately can't accept everyone who has applied. We do hope you persist as we go through these early years with high demand.

DO NOT SEND PAYMENT WITH THIS APPLICATION.

-30-

APPENDIX G

ONLINE MNP QUESTIONNAIRE

Master Naturalist Questionnaire

Welcome!

Thank you for participating in my survey. Please read the standard consent form below, and fill in the information at the bottom of the page to give consent for using your information in my study. The questionnaire should only take ~20-30 minutes to complete, and your answers will remain confidential. Thank you!

Project Title: Identity and motivations of naturalist training workshop participants and their relation to future career aspirations

Principle Investigator: Jennifer Mraz
Contact Email: Jennifer.Mraz@eagles.usm.edu
Contact Phone Number: 336-580-0552

PURPOSE: The purpose of this dissertation study is to investigate the identity of individuals participating in Master Naturalist Programs, and how those identities relate to their motivations for volunteering and their future or current career aspirations. This study is being performed to shed light on the types of individuals that participate in naturalist training activities, why they participate in environmental volunteer activities, and how those relate to their careers. This information could help naturalist training program coordinators to better design their programs and volunteer activities to achieve their goals and increase recruitment for participation. This information will also reveal the importance of naturalist training on naturalist careers.

DESCRIPTION OF STUDY: This study involves answering questions about the Master Naturalist Program, nature, volunteer activities, and careers on an online questionnaire. The questionnaire should take no longer than 20-30 minutes to complete depending on the length of responses. The questionnaire has some questions where you will select, e.g., whether you strongly agree to strongly disagree with a statement, as well as includes some open ended questions where you can elaborate on your experiences. The number of potential participants is as many as 175.

BENEFITS: Participants will learn more about the topic of identity, and its influence on volunteer motivations and career decisions. They will also benefit from reflecting on their experiences with nature, the Master Naturalist Program, as well as other naturalist activities in which they have participated.

RISKS: There are no known risks, inconveniences, or discomforts to participants. Participation is voluntary and the participant can withdraw their participation at any time. The length of time required to complete the questionnaire has been kept to a maximum of ~20-30 minutes to minimize potential discomfort.

CONFIDENTIALITY: Participant names are only needed to match participant's online questionnaire responses to their program application. After that has been done, any names shall be removed from the data and replaced with a pseudonym to maintain confidentiality. No one affiliated with the Master Naturalist Program will view the raw questionnaire data to maintain confidentiality.

ALTERNATIVE PROCEDURES: There are no alternative procedures to participating in this study. Participation in this study does not impact participation in the Master Naturalist Program.

PARTICIPANT'S ASSURANCE: This project has been reviewed by the Institutional Review Board, which ensures that research projects involving human subjects follow federal regulations. Any questions or concerns about rights as a research participant should be directed to the Chair of the IRB at 601-266-5997. Participation in this project is completely voluntary, and participants may withdraw from this study at any time without penalty, prejudice, or loss of benefits. Any questions abou the research should be directed to the Principal Investigator using the contact information at the top of the page.

Participant's First and Last Name:

Today's Date (MM/DD/YYYY):

[   ]

Are you 18 years of age or older?

○ Yes

○ No

Master Naturalist Questionnaire

Demographic Information

Please answer the following demographic questions.

What is your age?

[   ]

What is your race?

○ White

○ Black or African American

○ Hispanic

○ Asian

○ Pacific Islander

Other (please specify):

[   ]

What is your gender?

○ Male

○ Female

Are you currently pursuing a college degree?

○ Yes

○ No

Master Naturalist Questionnaire

Demographic Information - Pursuing a college degree

Please answer the following demographic questions.

What year are you in school?

- ○ Freshman
- ○ Sophomore
- ○ Junior
- ○ Senior
- ○ MS Degree
- ○ PhD

What area or field are you studying?

What career do you want to have after graduating?

What interested you in selecting your current career?

Master Naturalist Questionnaire

Demographic Information - Not pursuing a college degree

Please answer the following demographic questions.

What is the highest level of education you have completed?

○ High School

○ Some College

○ Associates Degree

○ Bachelor's Degree

○ Master's Degree

○ PhD

What was your major or field of study in college? (If multiple, please list all degrees and majors.)

What career or job do you currently have?

What interested you in selecting your current career?

Master Naturalist Questionnaire

When Participated in the Master Naturalist Program

I have participated/will participate in the Master Naturalist Program during:

☐ Fall 2012

☐ Spring 2013

☐ Fall 2013

☐ Spring 2014

☐ Fall 2014

☐ Spring 2015

☐ Fall 2015

☐ Spring 2016

Master Naturalist Questionnaire

Open-ended Questions for Future Participants (1 of 4)

Please answer the following questions, being as descriptive as possible. Type "N/A" as a response if needed.

What is your primary reason for attending the Master Naturalist Program?

What do you expect to learn during the Master Naturalist Program?

Which events or places do you plan to or have volunteered?

Master Naturalist Questionnaire

Please answer the following questions, being as descriptive as possible. Type "N/A" as a response if needed.

What activities have you participated in outside in nature?

Why do you go outside in nature?

What do you like the most about being outside in nature?

What do you like the least about being outside in nature?

Master Naturalist Questionnaire

Open-ended Questions for Future Participants (3 of 4)

Please answer the following questions, being as descriptive as possible. Type "N/A" as a response if needed.

In your own words, define an ideal naturalist.

What do you see as the role of a naturalist?

Master Naturalist Questionnaire

Open-ended Questions for Future Participants (4 of 4)

Please answer the following questions, being as descriptive as possible. Type "N/A" as a response if needed.

Do you currently see yourself as a naturalist?

Why or why do you not view yourself this way?

Who do you consider an example naturalist and why?

Master Naturalist Questionnaire

Please answer the following questions, being as descriptive as possible. Type "N/A" as a response if needed.

What was your primary reason for attending the Master Naturalist Program?

Have you maintained your status as a Master Naturalist? Why or why not?

What did you learn during the Master Naturalist Program?

Which events or places do you plan to or have volunteered?

Master Naturalist Questionnaire

Open-ended Questions for Past Participants (2 of 4)

Please answer the following questions, being as descriptive as possible. Type "N/A" as a response if needed.

What activities have you participated in outside in nature?

What do you go outside in nature?

Why do you go outside in nature?

What do you like the most about being outside in nature?

What do you like the least about being outside in nature?

Master Naturalist Questionnaire

Open-ended Questions for Past Participants (3 of 4)

Please answer the following questions, being as descriptive as possible. Type "N/A" as a response if needed.

In your own words, define an ideal naturalist.

What do you see as the role of a naturalist?

Master Naturalist Questionnaire

Open-ended Questions for Past Participants (4 of 4)

Please answer the following questions, being as descriptive as possible. Type "N/A" as a response if needed.

Do you currently see yourself as a naturalist?

Why or why do you not view yourself this way?

Who do you consider an example naturalist and why?

Master Naturalist Questionnaire

Environmental Attitude Questionnaire (1 of 4)

Please answer the questions below as honestly as you can. Use the following scale to indicate your degree of agreement with each item. Select the appropriate option to the left of each statement.

	Strongly Disagree	Somewhat Disagree	Neither Disagree nor Agree	Somewhat Agree	Strongly Agree
I think learning about nature is important.	○	○	○	○	○
I do not like spending time outside in nature.	○	○	○	○	○
I am comfortable with using technology (e.g., iPads and computers) on a regular basis.	○	○	○	○	○
I can communicate well with other people.	○	○	○	○	○
I think that scientific work is only useful to scientists.	○	○	○	○	○
I think that it is not important to learn about different plants and animals.	○	○	○	○	○
I think science is interesting.	○	○	○	○	○

Master Naturalist Questionnaire

Environmental Attitude Questionnaire (2 of 4)

Please answer the questions below as honestly as you can. Use the following scale to indicate your degree of agreement with each item. Select the appropriate option to the left of each statement.

	Strongly Disagree	Somewhat Disagree	Neither Disagree nor Agree	Somewhat Agree	Strongly Agree
I think that using technology is distracting.	○	○	○	○	○
I like communicating with other people	○	○	○	○	○
I think that I will be able to use what I learn about nature in my life.	○	○	○	○	○
I think it is important to learn about water conservation.	○	○	○	○	○
I would like to learn more about science.	○	○	○	○	○
I think using technology can help me learn science.	○	○	○	○	○
I think communicating with other people is difficult.	○	○	○	○	○

Master Naturalist Questionnaire

Environmental Attitude Questionnaire (3 of 4)

Please answer the questions below as honestly as you can. Use the following scale to indicate your degree of agreement with each item. Select the appropriate option to the left of each statement.

	Strongly Disagree	Somewhat Disagree	Neither Disagree nor Agree	Somewhat Agree	Strongly Agree
I think that science is useful to my life.	○	○	○	○	○
I think that it is not important for me to learn about nature.	○	○	○	○	○
I would like to learn more about nature.	○	○	○	○	○
I think it is important for me to learn how to use technology.	○	○	○	○	○
I think it is important to communicate with other people.	○	○	○	○	○
I think that learning about nature will not impact my life.	○	○	○	○	○
I think that learning about science is important.	○	○	○	○	○

Master Naturalist Questionnaire

Environmental Attitude Questionnaire (4 of 4)

Please answer the questions below as honestly as you can. Use the following scale to indicate your degree of agreement with each item. Select the appropriate option to the left of each statement.

	Strongly Disagree	Somewhat Disagree	Neither Disagree nor Agree	Somewhat Agree	Strongly Agree
I think that working outside doing science activities is fun.	○	○	○	○	○
I think that using technology is important.	○	○	○	○	○
I like when other people communicate with me.	○	○	○	○	○
I think that learning about nature can help the environment.	○	○	○	○	○
I think that science is too hard for me to learn.	○	○	○	○	○
I think that doing science activities is boring.	○	○	○	○	○
I think that learning about science can help the environment.	○	○	○	○	○

Master Naturalist Questionnaire

Volunteer Motivations Questionnaire (1 of 4)

There are many reasons why people volunteer. Please indicate the importance of each of these factors in explaining why you choose to volunteer.

	Strongly Unimportant			Neutral			Strongly Important
Concern for the environment	○	○	○	○	○	○	○
Protect natural areas from disappearing	○	○	○	○	○	○	○
See similar faces	○	○	○	○	○	○	○
Explore possible career options	○	○	○	○	○	○	○
Do something for a cause that is important to me	○	○	○	○	○	○	○
Experience will look good on resume	○	○	○	○	○	○	○

Master Naturalist Questionnaire

Volunteer Motivations Questionnaire (2 of 4)

There are many reasons why people volunteer. Please indicate the importance of each of these factors in explaining why you choose to volunteer.

	Strongly Unimportant			Neutral			Strongly Important
Meet new people	○	○	○	○	○	○	○
Be part of a well-organized project	○	○	○	○	○	○	○
Learn about specific plants	○	○	○	○	○	○	○
See improvements to the environment	○	○	○	○	○	○	○
Ensure future of natural areas for my enjoyment	○	○	○	○	○	○	○
Observe nature	○	○	○	○	○	○	○
Feel needed	○	○	○	○	○	○	○
Have fun	○	○	○	○	○	○	○

Master Naturalist Questionnaire

Volunteer Motivations Questionnaire (3 of 4)

There are many reasons why people volunteer. Please indicate the importance of each of these factors in explaining why you choose to volunteer.

	Strongly Unimportant			Neutral			Strongly Important
Get foot in the door at a place where I would like to work	O	O	O	O	O	O	O
To express my values through my work	O	O	O	O	O	O	O
Make contacts that might help career	O	O	O	O	O	O	O
Allow me to work on an area where I visit	O	O	O	O	O	O	O
Enrich my future recreation experiences	O	O	O	O	O	O	O
Know what is expected of me	O	O	O	O	O	O	O
Learn about specific animals	O	O	O	O	O	O	O
Help restore natural areas	O	O	O	O	O	O	O

Master Naturalist Questionnaire

Volunteer Motivations Questionnaire (4 of 4)

There are many reasons why people volunteer. Please indicate the importance of each of these factors in explaining why you choose to volunteer.

	Strongly Unimportant			Neutral			Strongly Important
Learn about environment	○	○	○	○	○	○	○
Work with a good leader	○	○	○	○	○	○	○
Help preserve natural areas for future generations	○	○	○	○	○	○	○
Work with friends	○	○	○	○	○	○	○
Feel better about myself	○	○	○	○	○	○	○
Enhance the activities I enjoy doing	○	○	○	○	○	○	○
Help me succeed in chosen profession	○	○	○	○	○	○	○
To live closely to my values	○	○	○	○	○	○	○
It is a required activity	○	○	○	○	○	○	○

APPENDIX H

INSTITUTIONAL REVIEW BOARD NOTICE OF COMMITTEE ACTION

THE UNIVERSITY OF
SOUTHERN MISSISSIPPI.

INSTITUTIONAL REVIEW BOARD
118 College Drive #5147 | Hattiesburg, MS 39406-0001
Phone: 601.266.6820 | Fax: 601.266.4377 | www.usm.edu/irb

NOTICE OF COMMITTEE ACTION

The project has been reviewed by The University of Southern Mississippi Institutional Review Board in accordance with Federal Drug Administration regulations (21 CFR 26, 111), Department of Health and Human Services (45 CFR Part 46), and university guidelines to ensure adherence to the following criteria:

- The risks to subjects are minimized.
- The risks to subjects are reasonable in relation to the anticipated benefits.
- The selection of subjects is equitable.
- Informed consent is adequate and appropriately documented.
- Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects.
- Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- Appropriate additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered regarding risks to subjects must be reported immediately, but not later than 10 days following the event. This should be reported to the IRB Office via the "Adverse Effect Report Form".
- If approved, the maximum period of approval is limited to twelve months. Projects that exceed this period must submit an application for renewal or continuation.

PROTOCOL NUMBER: 12072603
PROJECT TITLE: OUTSIDE: Over, Under and Through: Students Informally Discover the Environment
PROJECT TYPE: New Prject
RESEARCHER/S: Kristy Halverson
COLLEGE/DIVISION: College of Science & Technology
DEPARTMENT: Biological Sciences
FUNDING AGENCY: National Sciene Foundation
Proposal # 1224051
IRB COMMITTEE ACTION: Exempt Approval
PERIOD OF PROJECT APPROVAL: 07/26/2012 to 07/25/2013

Lawrence A. Hosman, Ph.D.
Institutional Review Board Chair

THE UNIVERSITY OF
SOUTHERN MISSISSIPPI.

INSTITUTIONAL REVIEW BOARD
118 College Drive #5147 | Hattiesburg, MS 39406-0001
Phone: 601.266.5997 | Fax: 601.266.4377 | www.usm.edu/research/institutional.review.board

NOTICE OF COMMITTEE ACTION

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- The risks to subjects are minimized.
- The risks to subjects are reasonable in relation to the anticipated benefits.
- The selection of subjects is equitable.
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- Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- Appropriate additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered regarding risks to subjects must be reported immediately, but not later than 10 days following the event. This should be reported to the IRB Office via the "Adverse Effect Report Form".
- If approved, the maximum period of approval is limited to twelve months.
  Projects that exceed this period must submit an application for renewal or continuation.

PROTOCOL NUMBER: 15010505
PROJECT TITLE: Identity and Motivations of Naturalist Training Workshop Participants and Their Relation to Future Career Aspirations
PROJECT TYPE: New Project
RESEARCHER(S): Jennifer Mraz
COLLEGE/DIVISION: College of Science and Technology
DEPARTMENT: Biological Sciences
FUNDING AGENCY/SPONSOR: N/A
IRB COMMITTEE ACTION: Expedited Review Approval
PERIOD OF APPROVAL: 01/06/2015 to 01/05/2016
Lawrence A. Hosman, Ph.D.
Institutional Review Board

THE UNIVERSITY OF
SOUTHERN MISSISSIPPI.

INSTITUTIONAL REVIEW BOARD
118 College Drive #5147 | Hattiesburg, MS 39406-0001
Phone: 601.266.6820 | Fax: 601.266.4377 | www.usm.edu/irb

NOTICE OF COMMITTEE ACTION

The project has been reviewed by The University of Southern Mississippi Institutional Review Board in accordance with Federal Drug Administration regulations (21 CFR 26, 111), Department of Health and Human Services (45 CFR Part 46), and university guidelines to ensure adherence to the following criteria:

- The risks to subjects are minimized.
- The risks to subjects are reasonable in relation to the anticipated benefits.
- The selection of subjects is equitable.
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- Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- Appropriate additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered regarding risks to subjects must be reported immediately, but not later than 10 days following the event. This should be reported to the IRB Office via the "Adverse Effect Report Form".
- If approved, the maximum period of approval is limited to twelve months.
  Projects that exceed this period must submit an application for renewal or continuation.

PROTOCOL NUMBER: CH12072603
PROJECT TITLE: OUTSIDE: Over, Under and Through: Students Informally Discover the Environment
PROJECT TYPE: Change to a Previously Approved Project
RESEARCHER(S): Kristy Halverson, Ph.D.
COLLEGE/DIVISION: College of Science & Technology
DEPARTMENT: Biological Sciences
FUNDING AGENCY/SPONSOR: National Sciene Foundation-Proposal # 1224051
IRB COMMITTEE ACTION: Exempt Approval
PERIOD OF APPROVAL: 12/04/2013 to 12/03/2014

Lawrence A. Hosman, Ph.D.
Institutional Review Board

THE UNIVERSITY OF SOUTHERN MISSISSIPPI.

INSTITUTIONAL REVIEW BOARD
118 College Drive #5147 | Hattiesburg, MS 39406-0001
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NOTICE OF COMMITTEE ACTION

The project has been reviewed by The University of Southern Mississippi Institutional Review Board in accordance with Federal Drug Administration regulations (21 CFR 26, 111), Department of Health and Human Services (45 CFR Part 46), and university guidelines to ensure adherence to the following criteria:

- The risks to subjects are minimized.
- The risks to subjects are reasonable in relation to the anticipated benefits.
- The selection of subjects is equitable.
- Informed consent is adequate and appropriately documented.
- Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects.
- Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- Appropriate additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered regarding risks to subjects must be reported immediately, but not later than 10 days following the event. This should be reported to the IRB Office via the "Adverse Effect Report Form".
- If approved, the maximum period of approval is limited to twelve months.
  Projects that exceed this period must submit an application for renewal or continuation.

PROTOCOL NUMBER: CH15010505
PROJECT TITLE: Identity and Motivations of Naturalist Training Workshop Participants and Their Relation to Future Career Aspirations
PROJECT TYPE: Change to a Previoulsy Approved Project
RESEARCHER(S): Jennifer Mraz
COLLEGE/DIVISION: College of Science and Technology
DEPARTMENT: Biological Sciences
FUNDING AGENCY/SPONSOR: N/A
IRB COMMITTEE ACTION: Expedited Review Approval
PERIOD OF APPROVAL: 04/01/2015 to 03/31/2016
Lawrence A. Hosman, Ph.D.
Institutional Review Board

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