ON THE ROAD TO HEALTHY COMMUNITIES: CYCLISTS' PERCEPTIONS OF THE ENVIRONMENT

A Thesis
by
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ABSTRACT

ON THE ROAD TO HEALTHY COMMUNITIES:
CYCLISTS' PERCEPTIONS OF THE ENVIRONMENT. (August 2011)

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This focus of this research was to gain insight into environmental perception as it relates to the connection between ecological and human health. Methodology for this task involved a photo elicitation process, which asked cyclists to photograph certain environments that they experience on a regular basis and discuss them during a formal interview. Findings supported the literature related to traditional ideas of *nature* as well the *scenic aesthetic* as popular environmental views. Appearance played a dominant role in perception of environmental quality, although sense of place, visual literacy, and other personal connections were highly important as well. Subjects displayed traits of anthropocentric, biocentric, or ecocentric viewpoints, with the majority of the participants falling into the biocentric category.

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CHAPTER 1

INTRODUCTION

Today's society seems to be disconnected from the natural world. Even in places acclaimed for their natural beauty and numerous outdoor activities, we find ourselves inside and oblivious to, or unappreciative of our surroundings. People are spending less time experiencing nature, which has proven to hinder the health of natural environments and people (For more details on this relationship, see Schroeder 1996, 2002; Miller 2006; Pyle 1978; Shultz 2000; Louv 2009). Interest in the interaction between people and nature has sparked the development of research fields specifically devoted to human-environment interaction. These fields attempt to explain the delicate relationship between people and nature.

This research explores environmental perceptions, preferences, and related behavior in cyclists in an attempt to gain insight into trends in human-environment interactions. These trends influence environmental policy and practice, including conservation efforts, protection of wildlife and natural areas, restoration projects, and other forms of environmental management. These actions are geared toward improving and maintaining wildlife diversity, and environmental quality on a comprehensive level. Environmental quality and health has been a rising concern over the past fifty years in the United States since Rachel Carson's publication of Silent Spring and the subsequent environmental movement (Hazlett 2004). The health and

integrity of natural environments is vital for a variety of reasons, including human benefits as well as intrinsic purposes. For example, healthy forests and wetlands help to cleanse the air and water supplies, generating healthier living conditions for people. In a survey examining the link between human and natural processes, Kellert (2004) notes some preliminary findings suggesting that natural areas characterized by relative health and integrity were more likely to have a population with an interest in outdoor activity and stewardship, as well as greater environmental knowledge and higher quality of life. Kellert's research also suggests that views and behaviors are cyclical, meaning that healthy environments support healthy people, or, conversely, that lower environmental quality is linked to reports of lower qualities of life. Additionally, healthy and connective natural environments promote positive living conditions for wildlife to grow and flourish.

Unfortunately, America's natural environments have been dramatically degraded over the last hundred years. For example, transportation emissions have increased air pollution rates dramatically. Climate change has been linked to anthropogenic factors (Oreskes 2004). The destruction and depletion of natural areas continues to be a problem, especially related to human development and expansion (Goudie 2006). In addition to environmental degradation, there are serious concerns for the human population. For instance, air pollution associated with combustion emissions has been linked to cancer, as well as negative reproductive and cardiovascular effects (Lewtas 2007). These are just a few reasons to be concerned with the quality of natural environments.

Because researchers have linked environmental concern to personal perceptions and interactions with natural areas, this study gathers information about the current state of environmental perception (Schroeder 2002). There are several research questions associated with this issue. A primary focus is to examine whether perception of environmental quality plays a role in where people choose to be, and if they naturally seek healthier environments. Thus, the main research question is, *Do people choose to be in places that they perceive to be environmentally healthy?* Secondary research concerns that this study examines are the current trends in environmental perception, thought, and behavior in general, such as, *what does a healthy environment mean to people*? And *how important are aesthetics and appearance when distinguishing the state of quality?* Data collection touches on these issues while attempting to answer the main research question.

The thesis is focused on the perception of environmental quality, which is not to be confused with scientific ideas of health based on ecological function. Perception is the focus of this study for several reasons. Ideas of environmental quality and health are somewhat malleable. Science is a continuous process of examining the world, which yields new information on a regular basis and often challenges previously held beliefs (Gobster et al. 2007). Thus, environmental quality is difficult to address, especially for members of the general public, who are not expected to have in-depth knowledge of ecological processes. The perception of health is not always an accurate representation of the state of health. However, perception drives action and therefore, may be considered by some to be more important than reality.

With the information gained from this thesis, I hope to improve the understanding of environmental perception. A greater understanding of perception can be used to guide policy and private initiatives to protect, conserve, and restore natural environments, especially at a local level. There is a link between the quality of environments and health of the people who experience them. Thus, the goal of this research is to gain insight into improving the state of environmental quality and ecological function, which will in turn improve human health and quality of life in general.

It is important to note the scope and scale of this research endeavor. This research is exploratory in nature; its purpose is to examine the current state of perception and behavior. Furthermore, this is a small-scale study.

CHAPTER 2

LITERATURE REVIEW

Introduction

This study examines the perceptions of familiar natural environments in order to gain insight into the protection, management, and restoration of natural environments to support environmental and human health. To address this issue, this thesis asks whether people choose to be in places they perceive to be environmentally healthy. Secondary concerns investigate the meaning of a healthy environment, and ecological quality as well as the role of appearance in determining health and quality. My research employs an interdisciplinary approach seeking individual accounts of environmental perception with an emphasis on the visual.

There are three major academic conversations associated with the context of these research questions. The first is environmental perception, which includes highly qualitative research from experts in the field, as well as a critical discussion of how people perceive natural environments. Second, based on the primacy of the visual, topics in landscape aesthetics especially related to ecological quality are discussed. Finally, sense of place is reviewed, because perception is concerned with individual interpretations of an environment.

Environmental Perception

The goal of this research is to understand perceptions of the natural environment. However, there is much academic debate over what constitutes "nature" and how "natural" it is (Macnaghten and Urry 1998). The perception of naturalness is spread over a continuum of beliefs ranging from a view that everything is natural, including forests, cities, and skyscrapers, to a view that nothing in existence is natural (Hull, Robertson, and Kendra 2001). The "everything is natural" idea is based upon the principle that anything that exists on earth is natural (Evernden 1992). This implies that humans are inherently natural beings and anything they generate can only be natural as well. However, many people view humans as apart from nature and their actions as mostly unnatural (Vining, Merrick, and Price 2008).

The extreme opposite viewpoint on naturalness deems nothing on earth as natural at this point in time, because human influence has affected everything (Cronon 1996). Most areas on earth have been touched or altered by humans to some extent. Even the most remote wildernesses are vulnerable to human-induced climate change and other indirect influences. Of course these two views of "everything" or "nothing" as natural are at the extremes of the spectrum, and most opinions of naturalness are likely to fall somewhere in between (Hull, Robertson, and Kendra 2001).

The question "What is nature?" is difficult to answer. A common theme in traditional definitions is to describe nature in opposition to humans, in a basic, nature-human dichotomy (Hull et al. 2001). According to environmental psychologists (Purcell et al. 1994) the simplicity of this definition carries flaws, because people cannot agree on landscapes that appear to represent both. The authors suggest that confusion stems

from the prevalence of landscapes that appear in between the traditional wilderness (nature) and the cityscapes (non-nature or human), such as farmland. Other definitions of nature are much more flexible, and may include human influence, as seen in Cronon's (1996) work on nature and wilderness. Nevertheless, the topic remains debatable and definitions cloudy.

This thesis aims to address the uncertainties of the idea of nature in order to understand perception and support efforts to define nature. Understanding a definition of nature is essential to environmental practice. In a critical examination of environmental ethics, Lamb (1996) argues that without a clear definition of nature, it is uncertain what is, or should be, protected. Additionally, Lamb stresses that without resolving this issue, methodologies in environmental treatment will remain conflicting. Similarly, Hull, Robertson, and Kendra (2001) suggest that understanding social constructions of nature and naturalness will enable us to determine what environmental conditions are desirable for the future. These issues associated with understanding nature are central to this thesis, because they guide perception. Based on a comparative study of environmental concern within the general public, Winter (2007) claims that environmental beliefs at a group level are important, because they can shape the ways in which people use natural areas, and have implications for environmental management and conservation.

Shultz et al. (2004) examine the psychological aspects of environmental interpretation and connection, contending that one's view of nature is subconscious, and thus, difficult to express. In a survey of 180 college undergraduates, Shultz (2000) found that perspective-taking techniques in which people attempt to empathize with

the perspective of others might bring awareness of these views to a conscious level. Thus, there are means to encourage people to engage with their own opinions of nature and express them, though it remains a difficult task.

Trends in Environmental Perception

In order to examine current trends in environmental perceptions, one should be familiar with previously documented trends. Shultz (2000), in a factor analysis describing the structure of people's concern for environmental problems, identifies three structural factors: egoistic, social-altruistic, and biospheric. Egoistic concerns stem from a person's valuing himself or herself over all other living things, including other people and the environment. Social-altruistic environmental concerns arise when a person values the welfare of other people or society as a whole. Finally, biospheric concerns focus on equal value of all living things.

Lamb (1996) offers a similar, but more simplistic take on the possible views of nature. In general, Lamb proposes two main views of nature, one where humans are placed in an ethical state above nature called "anthrocentric," and one where all life is considered equal, or "biocentric." Lamb's version groups all of the human-centered concerns into one anthropocentric category. This is a common means for discussing environmental views, and is present throughout the literature (Hendee and Stankey 1973; Flores and Clark 2001).

Recent trends have demonstrated a shift from anthropocentric to a more biocentric approach, suggesting that people value environmental quality more equally with human needs (Bengston, Webb, and Fan 2004). In their study using computer

coded content analysis to identify shifts in perception among U.S. residents between 1980 and 2001, Bengston et al. found an increase in biocentric value orientations and a decreasing trend in anthropocentric orientations. According to Richardson (1997), author of *The Green Challenge,* biocentric views emerged in the 1960s, challenging the anthropocentric thought that had dominated policy and practice since the late eighteenth and nineteenth century.

Expressing environmental views in dichotomous form is typical, however it tends to support an "us vs. them" way of looking at environmental issues (Flores and Clark 2001). In an analysis of differing environmental perceptions, Flores and Clark (2001) deem these dichotomous classifications as obstacles in reaching a common ground, especially for conservation purposes. Despite these noted shortcomings of environmental perception based on a strict dichotomy and the "us vs. them" mentality, it appears as though humans cannot define nature without considering their own stake in the matter (Cronon 1996). Cronon (1996) argues that the idea of nature is innately a human construction, and therefore, places humans as central to describing how people perceive nature.

How We Perceive

Ley (1977), a well-respected geographer, argues that the individual's everyday life experiences within society are significant and should be studied seriously. Ley asserts that there is meaning and importance in these experiences, because they shape and maintain overall perception. Thus, environments that are encountered on a regular basis are likely to provide the most insight into the foundation of environmental

perception. For example, people expect environmental quality in general to reflect the characteristics of healthy environments that they have already experienced.

In a frequently cited article, the human geographer, Tuan (1989), argues that the majority of primary interactions people can have with their everyday environments – and all else – begin at the surface level. The surface level of interaction is based on what can be perceived at face value, without any additional or supporting knowledge. In addition, Tuan argues that these surface interactions, especially related to personal experiences within natural environments, and an understanding thereof, are pertinent to self-awareness and heightened appreciation of the environment. This implies that surface interactions with the everyday environment shape environmental perception of particular places.

Surface interactions are those that can be experienced through sensory stimuli (Tuan 1974). Tuan examines the significance of each sense when perceiving the environment, and suggests that visual perception is foremost. Other researchers have noted the primacy of the visual when researching sensory perception of environments (Porteus 1985; Urry 2000). Porteus goes even farther to say that the visual may account for up to 90 percent of perception. Tuan (1974) argues that smell is likely next in importance as a perceptual component, as it is strongly linked to memory and other cognitive functions. He states that touch and sound follow equally in order of importance, although taste is often left out of surface level experiences, and thus, carries less weight in perceiving stimuli and forming opinions of experiences. These findings imply that visual cues guide initial perception. Some people may not be able to express what nature is, but as Cronon (1996) suggests, "you know it [(nature)], when

you *see* it." Based on this support for the primacy of the visual, methodologies in this thesis rely heavily on visual qualities, which are discussed further in Chapter 3: Methodology.

Landscape Aesthetics

Landscape aesthetics, defined by Alexander and Fairbridge (1999), involves both the environment and the experience of it that give rise to a class of aesthetic experiences. This goes beyond the idea of beauty and includes psychological and physiological processes of human perception. The emphasis placed on the visual, however, has implications for how people perceive environmental quality. For example, vibrant colors tend to denote healthy ecological function. For this reason, landscape aesthetics is of particular interest in the examination and formation of environmental perception. However, landscape aesthetics is a highly contested field concerning environmental quality. For example, trends in preference of environmental appearance may be taken as environmentally or ecologically healthy, when in fact they are not (Gobster et al. 2007; Parsons and Daniel 2002).

Landscape Aesthetic Preferences

Aesthetic preferences are the commonly held values of a group or individual related to how they prefer landscapes to appear. These preferences drive expectations and perceptions of environments. The implications of aesthetic preferences are somewhat unclear for perceptions of environmental quality. It is evident from the work of numerous landscape architects such as Stephen Kellert (2004) that people are drawn

to places that are aesthetically pleasing. Literature on landscape aesthetic preferences identifies two sources of origin, including cultural and environmental or evolutionary causes (Kaplan and Kaplan 1989; Nash 1982). In either case, the current American aesthetic preference dates back to earlier generations of human life in Africa and Europe. In an examination of psychological experiences of nature, Kaplan and Kaplan (1989) suggest there is a clear, evolutionary explanation for environmental aesthetic preference. In this case, early humans sought areas of refuge that were abundant in resources. Kaplan and Kaplan link these attributes to the appearance of African plains, where the human species originated. In a similar psychological analysis, Nash (1982) asserts that current aesthetic preference stems from cultural history and, more specifically, European aesthetic theory, as expressed in the paintings of seventeenth and eighteenth century European artists. These depictions are idealized representations of how nature should appear. This style was translated to American culture, as seen in the work produced by Thomas Cole and others in the Hudson River School.

Regardless of the source of current aesthetic trends in America, aesthetic preferences for natural landscapes remain constant and clear across the literature. Parsons and Daniel (2002) discuss current aesthetic preferences in the following excerpt, which can be related to environmental and cultural sources:

> Overwhelmingly, people in the US aesthetically prefer natural to urbanized environments, and natural environments of a particular sort are liked best of all. People prefer fairly open areas with low ground cover, a water source directly (pond, stream) or indirectly (e.g. flowering plants, green vegetation) indicated, occasional clumps of trees and shrubs, with the whole presenting a somewhat complex yet comprehensible scene. This amalgam of elements is noteworthy not only

> for its resemblance to historically recurrent Arcadian idylls, but also for its similarity to the savanna environments of our speciation. p. 46-47

In conjunction with Parsons and Daniel's statement, Vining, Merrick, and Price (2008) find similar aesthetic attributes, when attempting to analyze human perception of connectedness to nature. The authors find that perceptions of nature and natural environments include several aesthetic factors, such as descriptions of beauty, pure or clean environments, and open space. Vining, Merrick, and Price also find that first in importance is a lack of humans and evidence of human influence. Thus, an aesthetically pleasing natural environment lacks the presence of humans, which is likely a result of the aforementioned human-nature dichotomy.

These aesthetic principles can be seen in areas generated to preserve existing natural environments or recreate natural settings, such as America's parks, greenways, open space and other green infrastructure. Researchers of these public natural areas have examined landscape aesthetics extensively. Delavari-Edalat and Abdi (2010) analyzed popular opinions of aesthetics in an urban park setting, noting the importance of the presence of trees. In a New York City based study, Krenichyn (2006) found that people, and especially women, choose parks based on the natural beauty of the environment. And Garvin and Berens (1997) suggest that the general public seeks open space. Additionally, the lack of human influence remains important in these settings. In a study of national parks and aesthetic preferences, Colten and Dilsaver (2005) specifically address the human element, and suggest hiding evidence of man-made structures. This includes designing water, sewer, and garbage facilities as part of a natural landscape (i.e. underground or hidden in shrubbery).

Human influence is one of the most controversial components of environmental quality, and a commonly held view is that nature is healthier when absent from human influence (Dizard 1999; Kempton, Boster, and Hartley 1995; Gobster 1999). This means that in order for natural environments to maintain health, humans should leave them alone to thrive on their own. Recent research on this matter, however, has sparked a shift in this trend of thinking; some argue that healthy environments require human stewardship (Nassauer 1997, 2006; Eaton 1997).

Aesthetics and Ecology

The connection between aesthetics and environmental quality and management has been discussed and debated thoroughly over the years. In a critical examination of beauty and sustainability based on the work of Aldo Leopold, Lubarsky (2010) argues for the connection between aesthetics and sustainability. She suggests that beauty is an essential component of personal experiences and satisfaction within the natural environment. Lubarsky also argues that beauty and aesthetics are associated with environmental quality, which can be a major component of perceptions of natural environments. She bases this on Aldo Leopold's "Land Ethic." According to Leopold (1970), "A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise." Thus, beauty, environmental quality, and sustainability are intrinsically intertwined.

Eaton (1997) and Nassauer (1997) have examined aesthetics for promoting healthier environments. Their research is based on the perception that beauty and

health are associated with one another, which can be a problem for certain environments exhibiting poor aesthetic quality. Eaton (1997) finds that adding "cues to care" can alert the public of health within an environment. Cues to care are physical signs of positive human stewardship. This could involve erecting a fence around a seemingly unkempt, yet functioning landscape such as a wetland, or placing a sign at the site to demonstrate that a particular area is under someone's care, and should appear the way it does. Nassauer (1997) argues that adding a pleasing aesthetic factor will have the same effect. This could include planting flowers along the edge of a landscape to make it appear more healthy and lively.

These aesthetically pleasing attributes of an environment appear to denote quality or health. However, a pleasing appearance may not always imply health. In a collaborative essay debating the relationship between aesthetics and ecology, Gobster et al. (2007) suggest that aesthetic experience is tied to pleasurable human response in the perceptible realm; however, ecological functions may not be properly reflected or easily perceivable. In other words, people have a tendency to assume ecological quality based on aesthetic quality, though this may not always be the case. This is referred to as the *scenic aesthetic*, in which visual enjoyment of scenery that appears natural is preferred (Gobster et al. 2007). In a paper defending the scenic aesthetic, Parsons and Daniel (2002) note common objections: the scenic aesthetic is often considered to be superficial, intellectually shallow, and characteristic of passive, anthropocentric attraction to naturalistic environments. This is to say that the scenic aesthetic caters to the idea of beauty, but lacks any recognition or appreciation for ecological process and environmental quality.

According to Gobster et al. (2007) the *ecological aesthetic* emerged in response to the dilemma of the scenic aesthetic as a possible misrepresentation of environmental quality and contradictory to ecological concerns. The ecological aesthetic supports the idea that humans will take pleasure in landscapes that function in ecologically beneficial ways. However, these authors share differing opinions of which type of aesthetic should take precedence, when the two are conflicting. Should aesthetic preferences change to benefit ecological purposes? Or should ecologically beneficial landscapes be altered or designed to accommodate aesthetic preferences? One thing the authors agree on, however, is that healthy, yet unattractive landscapes are unlikely to last. For these reasons, aesthetics are closely tied to environmental quality in modern society and should be addressed, but they can pose problems for conservation and management practices.

Parsons and Daniel (2002) and Gobster et al. (2007) note that a problem arises when implementing an ecological aesthetic, because it requires knowledge of biological functions. In order to be able to recognize a healthy environment, one must understand the ecological importance of certain environmental attributes and the ways in which species function together. As Gobster et al. (2007) discuss, any knowledge obtained based on scientific inquiry is subject to change in the future with further investigation, as is characteristic of scientific knowledge. Furthermore, Gobster et al. (2007) stress that environmental phenomena operate and exist beyond the perceptible realm.

Interpreting aesthetic phenomena in general is based on visual literacy. In a study aimed at defining visual literacy, Brill, Dohun, and Branch (2007) polled several experts, resulting in a definition of visual literacy as "a group of acquired competencies

for interpreting and composing visible messages." Relating aesthetic interpretation to environmental quality and state of health, Natharius (2004) defined visual literacy, stating, "the more you know, the more you see." This implies that the more information a person has on a particular environment, the more aesthetic factors they will notice or recognize in that environment. All known information about an environment can affect interpretations of its health or quality, including emotional connections to particular places.

Sense of Place

The third component of this research is the idea of *place*. According to geographers, a place is a defined space comprised of physical and human characteristics that carries significance based on personal knowledge and experiences (Cresswell 1996). The sense of place associated with a landscape is interpreted on an individual level, affecting how one perceives environmental quality in a particular area, and it has the potential to affect environmental behavior. Cresswell (1996) states that determining sense of place is based on numerous factors, including environmental stimuli, cultural beliefs, experiences within an environment, and memories associated with certain experiences, among other things.

Kyle and Chick (2007) examined the social construction of sense of place based on recreationists' experiences at an outdoor agricultural fair. They found that development of sense of place was largely independent of the physical attributes of the setting. More importantly, the social aspects of the experience elicited meaning. This

implies there are other driving factors in developing connections to places, aside from the aesthetic or sensory stimuli.

In another study on the development and maintenance of sense of place, Amsden, Stedman, and Kruger (2011) examined a tourism dependent community in Seward, Alaska. They found that sense of place was highly associated with a sense of community. Kerstetter and Bricker (2009) conducted a similar study in a tourism-dependent community in Fiji. They found that the Fijians valued culture and historical traditions associated with place and valued protecting the physical environment as central to their livelihood. In these examples, the community as a whole values a sense of place that maintains cultural distinctions, often associated with the positive memories of social interaction.

In a study by Van Auken (2010), a lack of community integration and social interaction led to a different type of developed sense of place. Van Auken examined the effect of viewscape fetishism on communities' sense of place in American and Norwegian rural amenity areas. Viewscape fetishism posits that views of scenic landscapes are coveted commodities. Van Auken found that areas with access to scenic viewscapes attracted newcomers and seasonal homeowners who were interested in nothing more than personal appreciation and use of natural amenities. This created barriers to social interaction and fragmented landscapes, which led to a decreased sense of community and environmental degradation. Gobster et al. (2007) refer to this as *amenity migration,* and it has been identified as one of the driving forces of landscape change. The emotional connections to community interaction and social experience are

much more important in the generation of place attachment that is environmentally sound.

Conservation and Place Attachment

There exists a large quantity of literature supporting a connection between place attachment and conservation, without any outstanding discrepancies in opinion (Schroder 2002; Miller 2006; Pyle 1978; Shultz et al. 2004). Developing a connection to place is important for several reasons specifically associated with perception and environmental quality. According to the findings of several studies conducted by Schroeder (1996, 2002, 2007), aimed at examining how people experience natural environments, an understanding of these experiences is at the heart of promoting healthier environments. Nassauer (2006) also suggests this approach in a paper rethinking current conservation efforts and planning strategies. As Schroeder (2002) finds, once environmental connections are made, conservation typically follows.

In a study of landscape values and place attachment, Brown and Raymond (2007) found that displaying the visual and usage preferences of people within natural healthy environments could lead to a certain degree of place attachment. The authors found this to be especially true among study participants, implying that providing more pleasing environments will encourage more use and preference over time. In a study examining emotional connections to nature, Kals, Schumacher, and Montada (1999) found that some people may feel more connected to and responsible for the health of certain environments. Schultz (2000) found similar results in a study on personal connections to nature. All of these researchers noted connections between place

attachment and conservation attitudes. One positive implication of this could be new constituencies for conservation among local inhabitants and users of the land, as described by Vaske and Kobrin (2001) in their study on place attachment and environmentally responsible behavior.

Furthermore, as Miller (2006) notes, natural experiences and localized conservation efforts, even at a small scale, are connected to, and supportive of, the larger goals of conservation. This is evident in his two case studies on restoration efforts. Pyle (1978) goes even further to say that a lack of experiences and interactions within nature will actually decrease biodiversity and counter conservation efforts, based on his studies of environmental experiences. With these ideas in mind, more positive experiences with nature are encouraged in order to improve environmental quality.

Conservation efforts are not only beneficial to the natural environment, but also to the people associated with them. Gobster et al. (2007) suggest that healthy environments indirectly support a healthier people for a variety of reasons, from improved air quality to increased physical, emotional, and intellectual well-being, among others. Following this idea, Benedict and McMahon's (2002) paper for the Conservation Fund on Green Infrastructure argues that green infrastructure is a necessity because it supports environmental and human health.

Conclusion

The main fields of study pertaining to this research are environmental perception, landscape aesthetics, and sense of place. All of these categories support the larger goal of understanding perceptions of the natural environment and experiences within it, including implications for improved public health and environmental quality. Conclusions from this research will add to the body of literature, supporting a greater understanding of environmental perceptions in general and may support future endeavors related to environmental management, conservation, and restoration.

There are several "big ideas" within these literatures to be addressed in the analysis of this research. For example, the concept of *nature* is universally understood, however a lack of a clear definition of what constitutes naturalness looms over the literature. This concept is integral in determining how people perceive environments. Similarly, the two views of environmental perception, anthropocentric and biocentric, are key in determining views of environmental quality and health. The sample of research subjects may exhibit characteristics from both ends of the spectrum, as well as in between. Another factor of interest is sense of place. Sense of place is developed for a variety of reasons, including social, experiential, and environmental factors. Noting which of the reasons emerge and how powerful they are in determining places of interest or places representing environmental quality may add to the literature in this field.

These literatures relate to this thesis in several ways. Understanding environmental perception is central to the goals of this research, thus, an

understanding of commonalities and discrepancies within the literature is essential. Of most importance is the controversy surrounding the definition of nature and its implications for perception. Landscape aesthetics and sense of place are key to examining environmental perception, because perception relies primarily on the visual sense as well as any information or personal connections to a particular environment. These are the underlying factors of environmental perception to examine within this study.

CHAPTER 3

METHODOLOGY

Introduction

The primary research question of this thesis is, "do people choose to be in places that they perceive to be environmentally healthy?" Secondary foci include an examination of current trends in perception, as well as inquiries into the importance of the visual when interpreting environmental quality. Because this study seeks to understand how people perceive healthy environments, and the effect this perception has on their interaction with the environment, issues related to sense of place, visual literacy and aesthetics also come into play. Answering this question requires a methodology that addresses both the visual and knowledge or personal connection components associated with human environmental perception. The methodology of this study exposes research subjects to familiar environments while emphasizing the visual and aesthetic during data collection and analysis.

Methodologies based on analysis of personal experiences and perceptions are typically qualitative in nature, as is characteristic of most social science approaches to subjective research (Chenoweth and Gobster 1990). The primacy of the visual has been at the forefront of recent research causing a surge in methodologies that engage this type of analysis (Stewart and Floyd 2004). Among those methods, photo elicitation is often used, because of its interdisciplinary approach and versatile applications.

Photo Elicitation

Photo elicitation, simply described, involves the use of photograph(s) as a visual aid to the interview process. In this study, photo elicitation involves several key steps. These include: (1) giving the participants detailed instructions on the activity to complete and photograph; (2) having the subjects take photos of the desired objectives, based on their own opinions and experiences; and (3) interviewing the subjects about their experiences and using the personal photographs as a visual aid. Many researchers in a variety of disciplines have used photo elicitation methods. Several themes related to this research have been examined using the photo elicitation methodology, including environmental perception or experience, sense of place or place attachment, and other social concepts through sports or recreational activities.

Researchers of environmental perception or experience using photo elicitation include Ryan (2009), who examined mixed methodologies in examining environmental and place attachment. Ryan's goal was to determine what effect perceived value of living in an Australian shire community had on local consumption behaviors. Ryan found that the photo elicitation process added " richness and depth" to understanding attachment values. Loeffler (2004) studied the effects of outdoor activities on college student groups in order to understand why students participate and what they gain from the outdoor social experience, finding that students sought and gained a spiritual connection with the outdoors, connections with others through outdoor experience, and self-discovery. Maley, Warren, and Devine (2010) examined perceptions of built, natural, and social environments in a rural community to understand how perception affects food choice and physical activity behavior. Subjects noted that social, natural,

and physical environmental factors affected food choice and activity behavior. And Stewart et al. (2007) assessed lived experiences of participants in the landscapes of their daily lives in order to gain insight for urban fringe park development. They found that parks should embody public memories of the landscape, which means exhibiting a sense of ecological and cultural heritage, as well as allow for community-based restoration of such landscapes.

Photo elicitation has been widely used when studying issues concerning sense of place, as evident in the works of Kerstetter and Bricker (2009), who explored the sense of place that Fijians felt after extensive exposure to the tourism industry, in an attempt to maintain important features and qualities of Fijian identity. Results show that Fijians value the protection of tradition and culture, as well as the physical environment associated with the Fijian way of life. Similarly, Amsden, Stedman, and Kruger (2011) analyzed the creation and maintenance of sense of place in a tourism-dependent community in Alaska in order to examine connections between place attachment and community. Amsden, Stedman, and Kruger find that place and community are closely intertwined. Kyle and Chick (2007) examined recreationists' experiences at an outdoor agricultural fair to determine how sense of place is socially constructed. The authors found that the physical attributes of an environment are not driving factors in developing sense of place. Sense of place is also closely tied with environmental perception, engaging the visual and knowledge components of a desirable environment.

Sports and recreation studies have utilized photo elicitation when researching social concepts. The methodology has been used often over the last few decades in the fields of outdoor adventure sports (Loeffler 2004), general exercise (Maley, Warren and

Devine 2010), baseball (Snyder and Ammons 1993), college wrestling (Curry 1986), and women's college gymnastics and basketball (Snyder and Kane 1990). Thus the use of cycling as an activity to examine perceptions of environments using photo elicitation seems reasonable. There do not appear to be any previous studies involving cycling or cyclists and the photo elicitation methodology. (See *Cycling Risks and Concerns*, below, for a discussion of special considerations of combining cycling and camera usage).

Two Trends in Photo Elicitation

Collier was the first to develop the photo elicitation methodology, published in the 1960s (Collier 1967; Collier and Collier 1986). Since then, two main trends of photo elicitation have emerged. In one method, the researcher provides the subjects with photos to discuss during the interview process, with the same photos provided to all research subjects. The researcher then interprets the interview material. Suchar and Rotenberg (1994) used this type of photo elicitation when examining gentrification, as did Snyder (Snyder and Kane 1990; Snyder and Ammons 1993) during research on social aspects of athletics, and Harper (2001) while exploring the phenomenology of farming.

There are several benefits of using this type of photo elicitation in which the researcher supplies photos. Because the subject only views photographs that have been deliberately chosen by the researcher to reflect specific ideas or evoke certain emotions, the interviewer maintains control of the subject matter. This generates consistency across interviews and sets clear boundaries for analysis. Additionally, it is easier to compare and contrast the data because the subjects responded to the same set

of photographs. On the other hand, the researchers may miss valuable insight related to their topic if pictures do not prompt the participants to state all relevant information.

The second method involves instructing the subjects take photos that meet specific criteria. These personal photos are the focus of the interview process and, thus, act as supplementary data to the discussion. Kerstetter and Bricker (2009) used this method in their study concerning sense of place, as did Loeffler (2004), in her study of meanings of outdoor adventure experiences. There are positives and negatives to this type of photo elicitation. Because this method is geared specifically toward the interviewees' interests, personal photos are more likely to hold their attention while engaging in conversation. In addition it allows the participants to express emotions and opinions based on their own interpretations of the subject matter. However, this could be a drawback, if the participant misunderstands the research task; their photos may not accurately represent their opinions. Additionally, the photographs may often seem to provide more information about a place than a person is able to express. The researcher should exercise caution when examining photos in this manner, because sometimes a participant will photograph an image and discuss something entirely different or seemingly unrelated. For example, a photograph may display a tree in the foreground. The tree may appear to be the focus of the photograph, but upon discussion, the subject may reveal that a small bird perched on a tree branch is the focus. The photographs must be considered along with the subject's comments.

For this study, I chose the second photo elicitation method, because of its emphasis on individual perception. Personal photos tend to promote more meaningful commentary from the participant during the interview process. Thus, the photographs

support in-depth and emotional responses that would likely be left out otherwise. As Ryan (2009) describes:

> Photographs seem to motivate respondents to respond to visual prompts with more descriptive and insightful comments than they do without such visual aids. The photograph captures the outside image of what a respondent is sensing and experiencing inwardly, providing a prompt for the respondent to drive the interview with their own words, language and values. (p.110)

Furthermore, the nature of a personal photograph, including all of its meanings and associations naturally produces longer and more comprehensive interviews (Collier, 1967). This could be based on the human capacity to interpret images better than words or text, because of evolutionary causes; the ability to understand language is still developing and relatively new, compared to the ability to interpret visual stimuli (Harper 2002). Or perhaps it is due to the presence of a visual prompt. Whatever the cause, personal photographs tend to lead to more insightful interviews.

To some extent, insightful interviews occur because the personal photographs taken during the exercise prove to be a memory device during the interview process (Collier 1967; Harper 2002). Participants may recall specific details about the event, or a particular mindset or idea based on the images in the photo. The photographs may also remind the participant of lived experiences that are relevant to the study and promote additional commentary or discussion.

The collection of participant photos and interviews also provides additional information for the researcher to consider during analysis. Connections can be made by comparing and contrasting the photos of various participants, as seen in Loeffler's (2004) study on outdoor adventure activities. Loeffler categorized the photos of all

participants based on the images that were represented, such as an activity, scenery, or people, to see what patterns emerged. Then Loeffler examined the text of associated interviews to look for explanatory comments and meaning. This can be done for an individual's collection of photos, as well as for the entire collection of photos to further understand developing patterns. This allowed Loeffler to understand what was important to the subjects, based on the common images that they captured.

Limitations of Photo Elicitation

As with any methodology, there are cautions to utilizing the photo elicitation process. First of all, Stewart and Floyd (2004) caution the researcher on the use of photography in data collection, because of issues concerning visual literacy and subjectivity. The researcher does not possess the same knowledge about a photograph as the photographer does. Interpretations and an understanding of photographs are culturally constructed, and based on the personal experiences and knowledge of the viewer (Harper 2001; Natharius 2004; Stewart and Floyd 2004). Thus, the subject will take photos based on personal information, and this must be taken into consideration during the analysis. For example, the researcher must pay careful attention to the participant's interpretation of photographs and environments. During analysis, it is important to consider issues such as how well a subject knows a particular environment and what personal connections provide insight into a place that would be unknown to the general public. This may be particularly important when examining perceptions of environmental quality and aesthetics. For instance, a participant may perceive a place to be healthy based on personal knowledge of the environment, when

it would appear otherwise (e.g. wetlands) to someone without such information (Stewart and Floyd 2004). Harper (2002) discusses these problems of subjectivity as well, noting that this approach may cloud the meaning of the results. Thus, any conclusions drawn from the study could be considered weak or containing little scholarly merit. However, when dealing with human opinions, experiences, and behavior, results are intrinsically subjective, which is helpful to understand personal interpretations of the environment and answer the main research question.

The use of photographs themselves introduces additional research concerns. First, there is a question as to who owns the photos taken during the process. This copyright issue has been a problem in some documented cases, in which both the study subjects and the researchers claim the right to publish or distribute the photographs (Stewart and Floyd 2004; Purcell 2007). Generally speaking, a photographer has the legal rights to ownership of any photographs he or she takes. However, for research purposes, it is commonplace that the researchers may want to publish or otherwise use the photographs. In some cases, the photographers, while maintaining ownership, will allow the researchers limited use of the photographs for the purpose of study (Harrison 2002). Another option is to relinquish all rights of the photographs to the researchers, which is often the preference of the Institutional Review Board (IRB) (Stewart and Floyd 2004). I took measures to ensure that this issue was dealt with up front; all participants signed a waiver that denotes me, the researcher, as the sole owner of the photographs.

Another concern related to the use of photographs is that the images depicted may be a violation of privacy, even if photos are taken in public settings (Harper 2005).

In some cases people may be photographed without their knowledge or consent. Even though the setting is public, photographs of people may depict them in ways that could be construed as socially harmful in the future. This is an ethical matter that the IRB attempts to account for during the research approval process for studies involving human subjects or participants. For my research, subjects were instructed to take photographs of landscapes only, excluding themselves and other people from the photograph.

Despite its limitations, photo elicitation zeroes in on the inherent visual component of people's experiences and perceptions of the environment and environmental quality. Challenging the subject to produce specific types of photographs may increase cognitive awareness, if only at a subconscious level, which helps to solidify these opinions and perceptions, yielding better informed responses (Harper 2002; Ryan 2009).

The following section describes how photo elicitation is incorporated into the methodology of data collection and analysis. Additionally, it discusses how the research questions will be addressed and analyzed through the research design.

Research Design

My methodology is framed by the parameters of the study. For this thesis, consideration is given to the scope, amount of time, resources, and location available for data collection. Time and resources are limited to the amount of work possible for one researcher to conduct during an academic semester, without supportive funding. Additionally, localized data collection around the university was a must, because travel

was not funded and I remained in town for other university obligations. Following these restrictions, the methodology attempted to answer the research questions as well as possible. This section describes the research design, including participant criteria and recruitment, photograph instructions, interview structure and questions, as well as means of analysis.

Research Area

The research area was the vicinity of Appalachian State University, in and around Watauga County, North Carolina. Subjects were confined to environments in this area. This target area allowed for comparing and contrasting perceptions of environmental quality in similar environments.

Participant Criteria

Participants for this study on environmental perception met several criteria in order to be eligible to take part in the study. First, they were required to be available in proximity to the research area. All research, including meetings, interviews, and bike routes with accompanying photographs took place in the target area. Thus, participants needed to be available to complete these tasks. Additionally, they needed to have regular exposure to environments in the study area so that comparisons could be made between opinions of environmental quality and behavior. The participant pool also needed to be relatively homogenous for analysis purposes. Lastly, for Institutional Review Board (IRB) purposes, participants were required to be eighteen years or older,

in order to sign the consent form required for participation (More information about the IRB process is detailed in the Procedure section of this chapter).

For these reasons, the Appalachian State Cycling Team – located in Boone, North Carolina – was used to generate the participant pool. These cyclists are familiar with environments in the study area. They are avid cyclists, who bike long distances frequently, experiencing the local environments on a regular basis. Additionally, using this cycling team further aided comparisons and pattern definition during analysis. Members of the cycling team exhibit similar characteristics in age range, cycling experience, and educational background.

Many members of this cycling team are my colleagues, based on past cycling experience and socializing at bike meetings and races. The previously established connection to this group of people was expected to expedite the process of recruitment in the limited time frame for data collection. Participants were available through several known outlets, and were more likely to agree to participate based on familiarity with me. Also because of familiarity, these participants were more likely to be forthcoming during the interview process.

Participant Recruitment

The scope of this study is exploratory in nature and did not require a large sample size in order to produce results. Time constraints for the project also favored a smaller sample size; eight to twelve subjects was reasonable. In order to reach this cycling community and recruit an acceptable number of people, several avenues of

communication existed. These were the team's Internet forum, cycling meetings, and word of mouth recommendations.

The Appalachian State Cycling Team maintains a website for members (www.appstatecycling.com), which is frequented by most cyclists. The site hosts a web forum where members can post rides, race information, and other local cycling news, information, and opportunities. Posting a participant request on the cycling forum was a simple way to reach a large audience of team members.

Second, the Appalachian Cycling Team holds weekly meetings to discuss events. This provided a good opportunity to speak in front of the members present and make a case for participation, including a brief explanation of the research topic, procedures, and incentives. A sign-up sheet was passed around so that those interested could provide their name and e-mail, to be contacted later to schedule meetings and participation. The e-mail was also needed so that all participants received a copy of the consent form and the instructions as attachments. These were provided so that the participant was aware of the risks and requirements prior to individual meetings.

The final means of recruitment involved the snowball method. This is a referral method, where those who have already participated or agreed to participate recommend other possible participants and sometimes provide their contact information (Browne 2005). Assuming the referred person met the participant criteria, they were contacted directly and asked to take part in the project.

Photo Elicitation Activity - Cycling

Based on the connection between participants, biking as the photo elicitation activity was an easy choice. First of all, the cycling culture assures that riders explore their surroundings to find optimal bike routes. This suggests that they are familiar with their surrounding environments. Furthermore, since they bike many miles at a time, a bike ride was likely to expose the subject to a variety of environments (Humble Chronicler 2008). Additionally, cycling allowed the participants to fully experience the surrounding environments. Cyclists experience the sounds, smells, and other stimuli from the environment, contributing to a full experience (Tuan 1974; Pesses 2007).

Participants were instructed to go on a *road* bike ride, as opposed to a mountain, cross, or any other type of bike ride. Essentially, this involved riding mostly on roads and other paved areas, such as greenways. This provided a more diverse riding environment and many more public route options. Road biking made it easier to extrapolate the cyclists to the general population, because people are more likely to experience the same environments on a regular basis via public access, which is typically in the form of roadways.

Subjects were also instructed to go on their favorite, leisure bike route or a route that they are very familiar with, if there was no favorite route. This was to gauge whether cyclists chose to be in environments they perceived as healthy on a regular basis. Cyclists were encouraged to choose a route that would last a minimum of one hour, with no maximum distance or duration, to encourage them to experience a variety of landscapes.

Cycling Risks and Concerns

There were some risks involved with cyclists performing the tasks associated with the photo elicitation methodology. Road cycling carries its own risks to cyclists, including falling from mechanical or traffic related accidents, as well as dehydration and exhaustion. However, the photo task created some additional areas of concern. For example, the cyclists had to stop riding and dismount their bicycles to snap a photograph. Based on the photo criteria, cyclists may have needed to dismount their bicycles where there was not a designated shoulder or parking area to stop in. This was a safety concern for the participant due to traffic reasons.

Carrying a camera was a risk as well. The camera could have fallen onto the ground during transit, damaging the equipment. For this reason, cyclists were instructed to place the camera into a back pocket located on their cycling jerseys (cycling jerseys with back pockets are standard attire for avid cyclists). To help reduce problems associated with this task, I discussed the safety concerns with each cyclist on an individual basis. Additionally, safety precautions were outlined in the photo instructions as well as the consent form, which all participants agreed to and signed. (See Appendix A for the Consent Form).

Equipment

Participants required a camera in order to complete the photography component of the task. For ease of use, digital cameras were best for the experiment. This allowed the photographer to view his or her photos to ensure that the desired images were captured. This was extremely important, as the photograph itself is

essential to the analysis. Additionally, I loaned a camera to each of the cyclists, solely for the purposes of this experiment. This was to ensure that all materials were approved by me, and all photographs remained in my possession.

Blank memory cards were in all cameras. This provided ample storage space for cyclist's photographs, as well as ensured that other cyclists' photos were not visible and could not influence the participant. Cameras were provided with a protective case and a plastic bag to prevent damage from sweat and the elements during bike rides.

After completion of the ride and at least one day prior to the interview, the cyclist was instructed to return the camera so that I could print the photographs for viewing during the interview process. Cyclists' photographs were labeled and saved on my personal computer, and then the memory card was erased, so that the next person could checkout the camera.

Photograph Instructions

Photo instructions included information on the task to be completed as well as addressed safety precautions. To maintain simplicity, there were four photograph categories, representing two main topics: environmental quality and favorite landscapes. The focus of this research was perception of environmental quality, so a category pertaining to health was a must. Interpretation of healthy environments was left to the beliefs of the cyclist. This was an attempt to discover what a healthy environment meant to the participants as individuals. (See Appendix B for the full photo instructions).

The next category was the favorite landscape. This category was open to interpretation, as a place can be a favorite for any number of reasons. It was chosen to compare and contrast photos with those pertaining to environmental quality and health. The main goal was to look for similarities between healthy environments and the environments that people enjoy most – favorites, in order to gauge whether or not people like to be in areas that they perceive to be environmentally healthy.

The last two categories were intended to help the participants understand their own opinions through an environmentally unhealthy category and a least favorite landscape category. For example, some people classify items based on what they are *not*, so providing them with an opportunity to describe what a healthy environment is not, may help them determine what a healthy environment *is* to them. Forcing the participant to produce examples of both may have helped solidify their views of the topic, so that they were better able to explain their choices during the interview process. The participants were asked to provide a photograph representing each of the following categories:

(P1) An environmentally healthy landscape
(P2) An environmentally unhealthy landscape
(P3) A favorite landscape
(P4) A least favorite landscape.

Initial Meetings

Initial meetings with the participant were designed to fulfill several purposes, including fully explaining the research task, providing the necessary materials, and scheduling follow-up meetings. These meetings were held on an individual basis to

ensure each participant fully understood his or her responsibilities. Initial meetings were scheduled via email once people signed-up to participate, and were noted on a calendar created specifically for data collection purposes. All meetings took place in a group study room on the first floor of the Belk Library on Appalachian State University's Campus. This was in attempt to provide a comfortable and familiar, yet private setting for conversation, and to keep the atmosphere constant for all of the participants.

During the initial meeting, a copy of the photo instructions was given to the participant and fully discussed in detail, as well as safety information. A phone number to contact me was provided in case any problems, questions, or concerns came up later on. Once the participant acknowledged understanding of the task to be performed, the risks involved, and the use of any collected information, the interviewee consent form was signed. These forms remained in my possession for liability purposes.

A digital camera was also loaned to the cyclist during this meeting. This loan was documented on a sheet containing the following information: camera identification, Cyclist ID (a letter assigned to each participant to maintain anonymity), checkout date, and return date. Participants also received brief instructions on proper camera usage to help prevent damage, including a demonstration of how to use the assigned camera: turning the camera on and off, adjusting the zoom and view functions, taking a photograph, viewing and deleting previously taken photos, and proper camera storage. The subjects were instructed to return cameras at least one day prior to the interview, to provide me with time to print the photos in color and prepare for the interview.

Additionally, the participant was asked when he or she planned to go on the bike ride. If the date was known, the participant was asked to schedule a time after the ride to return the camera. If the ride date was tentative or unknown, the participant was asked to contact me to schedule a return time upon completion of the task.

Interviews

Interviews were scheduled to take place within a week of the bike ride in which the participant took photos, and as soon as possible after the ride. This was done to help keep the information from the experience fresh in the mind of the participant. All follow-up interviews took place in a group study room in the Library, as discussed in the initial meetings.

I needed the opportunity to ask more detailed questions about the photographs and their meanings, especially when participants provided vague or unclear responses. This supported the addition of questions that could delve further into the cyclist's views of environmental quality and how they manifest themselves in an everyday situation. Rather than working from a set of standardized questions, the semistandardized interview structure as outlined by Berg (2004), allowed for flexibility in the wording and order of questions.

So that the participant was prepared, I first explained how the interview process would work, including information about the format and the types to questions to be asked. Once the official interview began, it was tape-recorded on an RCA Digital Voice Recorder VR5220. Recording was essential for transcription and aided the analysis of interview material. Information that was collected, but not included on the recording

was demographic information, such as age, gender, occupation, student major, and hometown. All of these factors have been noted to affect landscape preferences in some way, as seen in the works of Gobster (1999), Krenichyn (2006) and Stewart and Floyd (2004), among others.

Initial interview questions identified the cyclist's experience with biking in general and riding in the Boone, North Carolina area to address familiarity. Information about the specific bike ride needed to be taken as well. This included questions about the length and duration of the bike ride (to determine whether the ride was long enough), whether or not the cyclist was biking alone (which may have affected concentration on the topic at hand), a description of the route direction and roads used (so that I had an understanding of where the photos were taken and could map them), as well as the reason for choosing this bike route. These questions were followed by questions addressing each photo the cyclist had taken.

Participants were asked to describe the location of each photo and what appeared in the photograph in detail. Then they were asked why the photo represents a particular category (environmentally healthy, environmentally unhealthy, favorite or least favorite). This involved the subject's describing all of the attributes in each environment that relate to its distinction and representation of a particular category. When discussing a participant's individual photographs, interviews were varied and questions were generated on the spot to cater to the individual's responses and understand their opinions. Following discussion of the photos, participants were asked if "taking the pictures helped them to reflect on their environments and their experiences within them." This was in attempt to gauge whether or not the photo

elicitation methodology was beneficial to this research, and to gather any additional insight that the participant might offer about the process.

Finally, I asked the subject questions about the overall experience and biking in general to wrap up the interview. This included but was not limited to the following questions:

(Q1) Does environmental quality play a role in choosing favorable bicycling routes?
(Q2) What are some of the things you look for in a good bike route?
(Q3) What makes a route unfavorable?
(Q4) Will you think about the environment and the topics we've discussed on future bike rides?
(Q5) Have you learned anything from this experience? What will you take away from this experience?

Each of these questions is designed to answer specific questions related to the research topic. Question 1 is a direct approach to determining whether or not environmental quality plays a role in where people chose to be. Additionally, participants were asked to describe their ideal bike routes as well as unfavorable bike routes. This was to compare and contrast the description of healthy environments with places people chose to be, as well as to look for patterns in characteristics of unhealthy environments and unfavorable bike routes. Question 4 is concerned with place attachment and conservation constituencies. It was meant to examine whether this experience had engendered any degree of attachment or desire to protect certain landscapes or promote healthy environments among the participants. Finally, the last question was meant to gather any additional information from the experience that may not otherwise be expressly discussed during the interview. It was intended to provide closure to the interview.

The interview was designed to be completed in one sitting and in one recording, which was be labeled on the participant's interview sheet and stored for transcription. The participants were thanked for their time and provided with compensation at the end of this meeting. (See Appendix C for the Interview Sheet and full list of questions).

Compensation

It is typical for participants to receive some incentives in exchange for their time and cooperation. Typically, the more time and risk involved with the project, the greater or more valuable the compensation should be. In many cases these incentives are monetary. However, there are some concerns with overcompensation. According to Seidman (2006), "setting the level of compensation can be tricky. Anything more than a token payment could bias the participants' motivation." It is also reasonable to offer something suitable for the target participant pool; in this case, something related to cycling.

Participants were provided with water bottles upon completion of the project, which was at the end of the interview. Each participant was offered a choice of water bottles and allowed to select one to take home. These water bottles were new and from the local bike shop, Boone Bike and Touring, which is a sponsor of the Appalachian State Cycling Team. Water bottles were available in a variety of colors and displayed the shop logo.

Methods of Analysis

For photo elicitation studies of this type, there are two sets of data to analyze. First is the collection of participants' photographs, which can be examined for patterns based on what appears in the photo. Second is the interview material, which has been transcribed, and can be analyzed by individual and the group to answer the research questions. However, the photos should be considered in conjunction with the interview material in order to support findings and reduce errors from misinterpretation.

I expected to find some specific results from the data analysis. This included affirmation that the subjects like to be in areas that they perceive to be environmentally healthy, first and foremost. Additionally, I expected to find that attributes of environmental quality and health are reflective of attributes of "nature" in general as discussed by Lamb (1996) and Vining, Merrick, and Price (2008). Additionally, indications that scenic or aesthetically pleasing landscapes are connected with healthy environments among the participants were expected. I also expected to find examples of anthropocentric and biocentric views of environmental concern.

This type of study offers me an opportunity for a simultaneous process, meaning that data analysis begins when data collection begins (Merriam 1988). In this case, broad patterns and trends that appear during the interview process are noted for use later during data coding. This is the same for patterns that emerge in the photos themselves, which are used during photo categorization and analysis. These patterns and processes are discussed in detail later on.

Photographs

In order to look for trends among the subjects related to environmental quality, the photographs were first examined from the environmental quality category. Next, this category was compared to the favorites to look for possible similarities. Each category was examined and compared to the others in this manner.

To determine whether a healthy environment was depicted as a "natural environment" as described by Vining, Merrick, and Price (2008) photographs were divided into two categories, representing natural landscapes or unnatural landscapes (depicting human influence). These distinctions are based on the idea that humans are separate from nature (Lamb 1996). These new photo categories were then compared across the four original categories to identify patterns associated with naturalness. This allowed for a deeper understanding of what the group feels about certain places and their relation to environmental quality and other major topics, such as connectedness to nature.

To fully understand the meaning of each photograph and the reasons to include them as part of a particular category, the photos were examined again, in association with the cyclist's commentary on each photo and category. In order to do this, I made "photo flash cards." This involved isolating all interview text associated with each photo and pasting it to the back of the appropriate photo. This generated a tangible card with a photo on one side and all related interview commentary on the other side. In this manner, I was able to easily locate, for example, all environmentally healthy designated photos for analysis of related commentary, or to gather all photos depicting a similar landscape for commentary analysis. Again, this allowed for patterns to emerge within

the group as a whole, and fostered easy analysis of the associated interview text. (See Appendix D for an example photo flash card).

Interviews

Analysis of the interview material began with transcription of all of the recorded interviews from the digital audio recorder into a Word document. Interviews were transcribed verbatim, and each interview was contained in its own word document. (See Appendix E for sample transcripts).

There are two main means of analyzing transcribed interview data. One method involves the use of transcription software, such as *Atlas ti*, which is used by Kyle and Chick (2007), or NUD-IST software, as seen in the work of Loeffler (2004). These software packages allow for standardized coding and other analyses, and are especially helpful when dealing with larger data sets. For the purposes of this study, qualitative analysis software was not necessary. One reason for this decision is that this study has an $n < 10$, which is relatively small and easily manageable without a software package. Furthermore, these programs are often difficult to use without proper instruction or help from someone familiar with the process. In addition, a lack of access to software packages, and their expense severely limits the possibility of use.

The goals of this analysis can be achieved from simpler means, and the human-based or manual methodology is most cost effective and time efficient. This method involves reading the transcripts multiple times, in order to pick out meaningful patterns. In this case, "categorical aggregation" is most helpful. This is a series of techniques using labels, codes, and categories to organize qualitative data as seen in the

work by Amsden, Stedman, and Kruger (2011). Initially, broad categories and patterns are noted in the data, and are compared with the themes that emerged during data collection. These patterns are useful for addressing overarching themes. Then, upon additional readings, coding of data takes place and smaller patterns and inter-relationships emerge. (See Appendix F for a list of initial categories).

Transcripts – Quick Response Analysis

In order to get a quick count and analysis of some of the most important themes, quick response or "short answer" sheets were generated. This involved listing the affirmative (yes), negative (no), or no clear response (unclear) for particular questions that are asked to each participant (Berg 2004). This type of analysis was conducted for the following questions:

(Q6) Do you think that environmental quality plays a role in the places that you choose to ride?
(Q7) Did you go on this bike ride alone?
(Q8) Do you think that taking the photographs helped you to reflect on your environment and your experiences within it?
(Q9) Will you think about the environment and the topics we've discussed on future bike rides or in general?

These quick response sheets were valuable for generating themes for further study. However, in-depth analysis of the complete text through coding was necessary to fully understand the nature and meaning of the data. (See Appendix G for a summary table of short answer questions).

Transcripts – Coding

A grounded analysis approach was used when coding the transcribed data, as was used in the work of Vining, Merrick, and Price (2008). This means that coding categories comes from actual data, and not any preexisting categories from me or other studies. Coding involved a constant comparative method and was completed in stages, based on the previous stage. This ensured that broad patterns were examined, and then the relationships between smaller or sub-themes were examined.

Initial coding began with open coding, which is a "wide first step" in the process of analysis (Strauss 1987). This identified all possible patterns in the data with labels or codes for further analysis. Essentially this is characterized by "line by line" coding, which provided a code for every line of text (Charmaz 2002). For this process, the idea was to begin coding in some way so that patterns and themes could emerge with further analysis. My analysis used this open coding process loosely as it was merely a starting point. (See Appendix H for an example of the coding process).

After the initial coding of all text, axial coding was performed as described by Berg (2004) and Stewart et al. (2007). This involved reading through the text again, as well as the initial codes to identify broad patterns in the codes and text. This process was conducted through several readings of the text, each time gaining more insight into the emerging patterns and identifying unifying themes related to the research question. In this step, I specifically attempted to uncover what environmental quality and health meant to individuals and the group as a whole. The emerging themes were then analyzed further with the preexisting literature.

Writing Process

Once coding was completed, I began a process of memo writing. This is an analysis of the coding, and "[raises] codes to conceptual categories" according to Charmaz (2002). Memo writing allowed me to write the patterns and revelations down on paper and linked the coding phase of the analysis to the initial writing of the results and discussion chapter. At this point, other approaches were taken to aid the writing process and to better express overarching concepts. For example, I counted the number of entries representing a category or theme, such as the number of people who mention car emissions as environmentally unhealthy, to generate descriptive statistics and to allow for the "demonstration of magnitude," as suggested by Berg (2004). (See Appendix I for a sample memo and table of theme of counts).

Once the results became clear and the writing process began, I attempted to link the findings to previous research and discuss how the study and results fit into the body of related literature, including conforming and contradictory patterns.

Geographic Information Systems (GIS) Analysis

In order to aid visual and spatial analysis of perceptions of the environment, ArcGIS 9.3.1 software was used to map out the locations of participants' photographs. Several different layers of data from the SDE Geospatial Database were added to the base map to look for patterns, including elevational data, locations of urban areas, and roadways and county information, among others. The main purpose of using GIS software is to perform basic visual analysis of spatial patterns, offer supplementary information to the analysis of photograph and interview material, and to provide a

visual map of the locations of the photographs. (See Appendix J for examples of GIS maps).

Procedure

The whole procedure, from recruitment to the final interview took place in the fall of 2010 from late September to early November. A calendar was kept in order to keep track of all appointments with the participants. The following is an account of when the data was collected, including any unexpected issues.

Institutional Review Board (IRB) Approval

Before any data could be collected, approval was obtained from the Institutional Review Board (IRB). This is the case for any study that involves the use of human subjects, in order to ensure ethical treatment and procedures. A request for review of human participants research was submitted to the IRB in August of 2010. This application detailed the nature of the research and the procedure to be followed, including the benefits and risks involved for the participants, as well an interviewee consent form to be signed by all subjects prior to their participation. Approval was received from the Institutional Review Board on September 1, 2010.

Participant Selection

Once IRB approval was received, contacting and recruiting participants was the first step in the procedure. This was accomplished in several ways. First, I asked a colleague (Cyclist A) to participate in the study and to post a message on the cycling

forum from his account. He agreed to both, and submitted an email posting on September 14, 2010 to Appalachian State University's Cycling Team Forum (http://www.appstatecycling.com/forum/) to solicit participants. One participant (Cyclist B) responded to this request the following day via email, as suggested in the posting.

Next, I spoke at the weekly cycling meeting to explain the study and solicit participants. This event took place in the McRae Peak room of the Plemmons Student Union on the evening of September 16, 2010. Those who wished to volunteer their time and services were asked to include their name and email address on a "sign-up" sheet. Also on September 16, Cyclist B had his initial meeting after the cycling meeting, and not in the library, as stated in the research design. This was due to scheduling and time conflicts. However, all other meetings took place in the library. Among the 14 people who signed-up that evening were Cyclists C, D, E, F, and H.

Chronological Procedure of Data Collection

All those who signed-up during the cycling team meeting were contacted via email on September 20, 2010 to schedule an initial meeting to fully explain the instructions, sign-out a camera, and to sign the consent form on an individual basis. All volunteers received a copy of the consent form and the instructions in an email attachment for review prior to the meeting. Additionally, Cyclist A had an initial meeting, and returned the camera on the same day. As soon as each camera was returned from a participant, the photos were printed to be used during the interview.

Between September 22 and October 3, two people responded to the email, but failed to follow through. Six people did not respond to follow-up emails, and two people broke bones over the weekend and were unable to participate. One additional person in this group agreed to participate and set up an initial meeting. On September 23, 2010 Cyclist B returned his camera. Cyclist A had his interview in the library on September 27. All other interviews occurred in library study rooms as well.

Several days of waiting took place and then all of those who had signed-up but not responded, received individual emails requesting participation again on October 5. Five people replied and set up initial meetings and email correspondence continued every day through November 4, 2010.

On October 6, Cyclists C and D held their initial meetings, and Cyclist E failed to show up for a meeting. During these initial meetings, one of three digital cameras was assigned to the participant, including a Canon PowerShot A630, a Nikon COOLPIX L22, or an HP Photosmart R717. The Canon and Nikon cameras belong to me. My cameras were expected to be the only needed cameras. However, increased participant volume forced me to rent a camera from Appalachian State University's Educational Media Services (EdMS). This rental is the HP Camera, and it was used by one participant (D). In every instance, all camera memory cards were empty when loaned to the participant. They were provided with a protective case (except for the HP, which did not have a compact case), and a plastic bag.

On October 7, I spoke at the weekly cycling meeting in the McRae Peak room of the Plemmons Student Union to recruit additional participants, and one person (Cyclist I) signed-up. Also on October 7, Cyclist B held his interview, Cyclist E had an initial

meeting, Cyclist C returned the camera, and an additional volunteer had an initial meeting.

On October 8, Cyclist D returned a camera and Cyclist C held an interview. Additionally, one other participant was solicited via the snowball method on October 8 (Browne 2005). In this manner, those participants who had already completed their interviews were asked if they knew of any others who fit the criteria and might be willing to participate. One person (Cyclist G) was contacted by me via this method, and agreed to participate in the study.

The next week, on October 11, Cyclists E and G failed to show up to scheduled meetings. On October 12, Cyclists F and G held their initial meetings and Cyclists D and E held their interviews. Cyclist E returned his camera at the interview, in which case, photos were not printed ahead of time and were viewed on the camera screen during the interview. On October 13, Cyclist F returned his camera and Cyclist H held an initial meeting. October 15 was the date of the interview with Cyclist F. During the interview with Cyclist F, there was a technical error with the digital recorder. This interview had to be recorded in three separate recordings, although the quality of the interview remained normal.

During the week of Fall Break, Cyclist H returned her camera on October 20, 2010 and completed her interview on the October 21. In the following week Cyclist H returned his camera on October 25 and held his interview on October 27, 2010.

Several events took place in the month of November. Cyclist I held an initial meeting on Thursday, November 4, 2010 and then returned his camera and completed the interview on the same day, November 18, 2010. His photos were not able to be

printed ahead of time. Additionally, a camera was returned on November 11 by a participant who did not complete the photo task or continue with the project. She held this camera for over a month, preventing its use by any other participant.

At the end of every interview the participant was thanked and provided with a choice of water bottle for compensation. Every participant accepted a water bottle. Once all of the interviews were completed and data collected, transcription of the interview material began. This marked the beginning of the analysis.

Conclusion

The photo elicitation methodology was chosen to examine perceptions of environmental quality and other topics related to the research questions while emphasizing the visual components of perception. Analysis methodologies were focused on examining patterns within the collection of photographs and the interview material, separately and together. GIS software was used as a supplementary tool for examining these patterns further. The procedure expressed how the methodologies for data collection were followed, as well as problems that came about. The following chapter details the results and findings of the analysis, discussing their implications within the literature and for the future of environmental perception and behavior.

CHAPTER 4

RESULTS AND DISCUSSION

Nine participants completed the photo elicitation tasks and interview process. Subjects were all current Appalachian State University students, including two graduate students and seven undergraduates. Their ages ranged from eighteen to twenty-seven years, with a mode of nineteen and a mean of twenty. Only one participant was female, and the rest were male, which is typical of cycling in general. Men greatly outnumber women in participation in team cycling. The subjects had a combined cycling experience of 52 years, with an average of 5.8 years of experience as serious or avid cyclists. However, most participants had been biking in the Boone, North Carolina area for less than one year. (See Appendix K for a table of participant demographics).

Data collected from these subjects consisted of the photographs taken by each cyclist as well as the transcribed material from individual interviews. A total of 39 photographs were collected. Three participants, Subjects B, D, and I, elected to take more than the required number (4) of photographs. Each of these three subjects took 5 photographs, resulting in an additional photo/example for one of the four categories. This is acceptable, as it provides more insight into the participant's views on environmental quality, preferences, and other related topics, which were thoroughly discussed during interviews. Interviews ranged in length from roughly 11 minutes long

to over 27 minutes long, with an average of about 20 minutes each. (See Appendix D for a sample interview transcript).

Because of the group's relative homogeneity in many demographic aspects, analysis focused on data from the group as a whole. The primary focus of analysis was to answer the main research question: Do people choose to be in places that they perceive to be environmentally healthy? However, other secondary analyses were conducted to address how people perceive a healthy environment and to look for trends in perception of environmental quality and landscape preference through examination of interview material and photographs, separately and together.

Do people choose to be in places they perceive to be environmentally healthy?

A close examination of the interview transcripts is required to answer the main research question. Although no definitive answer emerged from the data, several insights into the matter are evident. When directly asked, "Do you think that environmental quality plays a role in the places that you choose to ride?" Seven of the nine subjects responded in the affirmative. Further analysis shows that five of the cyclists specifically indicated that they like to be places exhibiting healthy environments. For example, Cyclist A stated, "I consider [the healthy environment] somewhere you would want to be, just like my favorite [environment]." Additionally, Cyclist C said, "I feel that the environment is more healthy outside of the city, so I tend to go out there, rather than stay in the city."

Additionally, there is some support for these types of healthy and favorite environments as destinations while cycling. The previous statement from Cyclist C

demonstrates this sentiment. Furthermore, Cyclist B affirmed, "When I'm thinking about planning out a new ride, part of it is just to achieve, not actually a distance… but the place. Part of it is also finding natural beauty. So, it's like you plan routes around getting to certain locations." Four subjects noted distinct similarities between their favorite environments and healthy environments, suggesting that they may favor environments that they perceive to be healthier. Cyclist A stated that his favorite and healthy environments were very similar in that they are both "mountain sceneries" and "picturesque," and that they were both "somewhere you would want to be." Cyclist G noted, "[healthy environments] are like everything I said I liked," implying that healthy environments exhibit the same visual qualities as her favorite environments, which were places she says she prefers to be. Cyclist I also discussed these similarities, offering that his "favorite places are always places where there's no buildings or people, [but] just nature," which is also how he described a healthy environment.

Three other subjects said that rather than seeking healthy environments, they simply attempt to avoid unhealthy environments. Cyclist H said, "if there's any way I can stay away from the [least favorite] or [unhealthy environments], I will. But I guess if we're avoiding the unhealthy ones, we just kind of find the [healthy environments] anyway." Similarly, after connecting car traffic with unhealthy environments, Cyclist A asserted, "If it's congested with cars… then it's a place I will avoid going on a bike ride." Five other cyclists connected car traffic with unhealthy environments in a similar manner due to car emissions, wasted resources such as gasoline, and increased air pollution. For example, when asked why he thought cars at an intersection represented an unhealthy environment, Cyclist F responded with, "I just envision a big cloud of

carbon dioxide and car emissions going up right there." While these sentiments do not confirm that they choose to be in places of perceived health, they do attest that the perceived state of health plays a role in where people choose to be and to bike, which remains consistent among the subjects.

However, the subjects encountered unhealthy and undesirable environments while cycling, whether they make efforts to avoid them or not. Six of the nine subjects took a photograph of major highways and intersections that they encountered as they were leaving town, and characterized them as either least favorite or unhealthy environments. This suggests that cyclists sometimes have to go through unhealthy and unfavorable environments to reach healthier ones. For example, Cyclist F stated that, "Generally, there's only one way in and out of Boone… and that's usually [a] major road."

Overall, results suggest that perception of environmental quality plays a role in the places where the subjects choose to be and to ride. Some subjects prefer to be in places they perceive to be environmentally healthy, while others focus attention on avoiding unhealthy environments. Furthermore, there appears to be a positive connection between favorite environments and healthy environments, and many participants choose to be in their favorite environments, which exhibit similar physical and visual qualities as perceived healthy environments. Additionally, the goal destination of some leisure bike rides is to reach healthier environments, but travel through unhealthy environments may be unavoidable while en route. Thus, even if people prefer to be in environments exhibiting health, the nature of built environments

and travel options may not allow them to be in such places without experiencing perceived unhealthy environments as well.

How People Perceive the Environment

A secondary question in the research focused on what a healthy environment means to the subjects and how they perceive it. This inquiry also addresses environmental concern. In other words, were the subjects concerned for environmental health for reasons related human needs, natural or environmental needs, or both? To address this issue, interviews were examined on an individual basis, taking the overall perspective of the participant into consideration.

An examination of how these subjects view the environment, in terms of anthropocentric or biocentric values, produced some unexpected results. It appears as though there is an additional type of environmental concern within the data set, not described by Lamb (1996) or Shultz (2000) among others. These traditional types of environmental perception suggest that people either view human concerns as above nature or equal to nature (Lamb 1996). However, when considering environmental perception among the subjects, evidence exists supporting nature or environmental needs over human needs.

In this study one subject strictly valued human needs above all else (anthropocentric). Cyclist B gauged environmental quality based solely on function in regard to human needs. For example, he chose his healthy environment based on its qualities as "a space that has been engineered for people to appreciate it." Conversely, one subject valued nature above all else (new category, which I will refer to as

ecocentric). For example, Cyclist I made comments such as, “man should have stopped creating ways to move about after the bicycle,” because he disagreed with the use of cars “and what [they] do to the environment.” Additionally Cyclist I was displeased with camping practices, and stated, “I would hate seeing deer in civilized places, where their homes have been cut down so that a bunch of people could go and camp.” This sentiment expressed his concern for the livelihood of other living creatures to the extent that minimal human impact was detrimental to environmental quality.

The ecocentric category of thought is not unheard of within the literature, although it remains a controversial idea in the environmental perception realm. Aldo Leopold first introduced the idea of ecocentrism in his work, *A Sand County Almanac*, published in 1949. However, widespread acknowledgement and attention to this type of environmental thought has developed slowly and more recently. Many researchers still discuss perception traditionally, as Lamb (1996) does. Rowe (1994), a renowned environmental ethicist and geo-ecologist writes of this issue in an opinion piece, stating:

> The ecocentric argument is grounded in the belief that compared to the undoubted importance of the human part, the whole Ecosphere is even more significant and consequential: more inclusive, more complex, more integrated, more creative, more beautiful, more mysterious, and older than time. The "environment" that anthropocentrism misperceives as materials designed to be used exclusively by humans, to serve the needs of humanity, is in the profoundest sense humanity's source and support: its ingenious, inventive life-giving matrix. Ecocentrism goes beyond biocentrism with its fixation on organisms, for in the ecocentric view people are inseparable from the inorganic/organic nature that encapsulates them. They are particles and waves, body and spirit, in the context of Earth's ambient energy (106).

Rowe’s statement attempts to stress the importance of ecocentrism in relation to the anthropocentric and biocentric values, while noting their inherent differences.

The majority of the subjects (7) thought of environmental quality and health as a balance between nature and human concerns (biocentric). Of interest is that these biocentric concerns appeared to hold value within more urban environments. That is to say that, within urban areas, these subjects were more inclined to deem an environment healthy that balanced the needs of humans with environmental concerns. When discussing healthy environments outside of urban areas, most of these subjects (4) valued nature over human needs, thus suggesting a conditional thought process. (See Tables 4.1 and 4.2 below for the subjects' reasons for environmental concern and a breakdown of biocentric concern. See figure 4.9 below for a map showing photograph locations in relation to urban areas).

REASONS FOR ENVIRONMENTAL CONCERN AND THOUGHT					
	Primary Reason for Concern		**Type of Environmental Thought**		
Subject	**Concern for Humans***	**Concern for Nature***	**Anthropocentric**	**Biocentric**	**Ecocentric**
A	✓	✓		✓	
B	✓		✓		
C	✓	✓		✓	
D	✓	✓		✓	
E	✓	✓		✓	
F	✓	✓		✓	
G	✓	✓		✓	
H	✓	✓		✓	
I		✓			✓
* A check mark in both the Human and Nature columns per subject indicates equal concern for both					

Table 4.1. Reasons for Environmental Concern and Thought. This table provides a summary of the subject's reasons for environmental concern, based on analysis of individual interview transcripts.

BREAKDOWN OF BIOCENTRIC THOUGHT		
	Primary Reason for Concern	
Subject	**Balance between Humans & Nature**	**Slight Emphasis on Nature** (especially outside of urban areas)
A		✓
C		✓
D	✓	
E		✓
F	✓	
G		✓
H	✓	

Table 4.2. Breakdown of Reasons for Biocentric Thought

The breakdown of biocentric thought came from a noticeable preference for nature over human needs under specific circumstances. First, these seven subjects appear to care for a balance between the needs of humans and nature. This is especially the case in urban areas. For example, when discussing the unhealthy qualities associated with traffic at a busy intersection, Cyclist G expressed concern for several reasons. She stated that the traffic was responsible for the air being "so polluted," hinting at an environmental concern. Additionally, she asserted that the traffic made it "feel like it's unsafe to ride through there," posing a concern for people. Cyclist F discussed similar concerns about a healthy park setting. He concluded that the park, including a lake, was "healthy for the environment," while the sidewalks provided a "walking friendly" environment for those who live near and visit the area. In this manner, the subjects demonstrated a balanced concern for humans and nature.

The seven subjects differ when discussing non-urban areas. Three of these subjects maintained a preference for balance when describing qualities of non-urban areas. For example, Cyclist D showed balanced concerns when discussing the positives of a small-scale farm operation:

> "So they do all organic farming. They don't use any petroleum based products on their farm, which is a more environmentally sound way of doing farming. They are a local farm, [and] getting your food locally is a huge environmental health benefit. As a cyclist you can identify with that, because the further away your food comes, the more junk that gets put into the air. And then nobody likes to breathe dirty air."

Four of the subjects appear to have shifted concern toward the needs of nature when examining environments outside of urban areas. Cyclist C discussed a healthy lake environment without any regard to human concerns. He stated that the area "[was] healthy, because you've got the trees and of course you're going to have a lot of life in there and the lake too. It's not disturbed a lot by people; it's in a natural state." Thus, his concern for the state of the environment excluded human use in favor of a healthier lake area. Similarly, Cyclist A noted that an abandoned housing development was unhealthy for the environment: "So they're clear-cutting all this forest, and adding all of this new infrastructure, and then completely abandoning it roughly a third of the way through the project." His sentiment was that the natural environment had been degraded by people, noting a concern for nature, but not the need for human use and development. In these cases, concern existed primarily for the state of the natural environment. Trends in perception of environmental quality were also examined through analysis of the photographs.

Trends in Perception of Environmental Quality

An additional concern in this research was to examine perceptions of environmental quality and trends among the subjects. Initial analysis of emerging trends within the data was conducted through the collection of photographs taken by all of the subjects. However, to increase the validity of results, and reduce errors in interpretation, photos were also analyzed in close connection with the interview material.

An examination of the photographs demonstrates consistency among the subjects in several instances. The four most popular photographs depicted mountain vistas, mountain pasture environments, areas exhibiting obvious human influence, and the intersection of Highway 321 and Highway 105. All of the mountain environments were viewed positively, as either a favorite or healthy environment. Alternately, the photos exhibiting human influence, including the intersection photos were typically categorized as negative (least favorites or unhealthy environments).

Seven of the subjects chose to take a photo of one of the mountain environments to represent their favorite or healthy landscapes. All of the vistas were categorized as favorite environments. Additionally, half of the photos representing mountain pastures (three of six) were categorized as healthy environments by the subjects. This may indicate that visual qualities of healthy environments and favorite places overlap for some of the participants. This trend among the photographs, combined with support from the interview material discussed previously (see subsection: *Do people choose to be in places that they perceive to be environmentally healthy? p.55*) make this claim stronger.

Figure 4.1 (Cyclist A: Favorite Place, left) and Figure 4.2 (Cyclist E: Healthy Environment, right) are examples of the positive mountain pasture environments, half of which were categorized as favorite places.

Figure 4.3 (Cyclist C: Favorite Place, left) and Figure 4.4 (Cyclist I: Favorite Place, right) Are examples of the mountain vistas, which were the second most popular positive environments.

Another overwhelming trend within the collection of cyclists' photographs was related to the intersection of Highway 321 and Highway 105. Six of the nine subjects took photos of some aspect of this intersection. Two of those six photographed the area on two occasions, resulting in eight total pictures of this area. All of these photos held a negative connotation. Five of the eight photographs were categorized as least favorite places, and the remaining three were categorized as unhealthy environments. Commentary about all of these photographs was similar, stating concerns with traffic

congestion, car exhaust and subsequent air pollution, as well as personal safety issues. In addition to the eight intersection photos, sixteen photographs showed evidence of human influence. Of those sixteen, ten were categorized negatively, as either unhealthy or least favorite environments. In this case, qualities of unhealthy environments and least favorite environments appear to overlap. (See Figures 4.5 through 4.8 for examples of photographs depicting human influence).

Figure 4.5 (Cyclist C: Least Favorite Place, left and Figure 4.6 (Cyclist H: Unhealthy Environment, right) show examples of the photographs taken at the intersection of Highway 321 and Highway 105.

Figure 4.7 (Cyclist C: Unhealthy Envioronment, left) amd Figure 4.8 (Cyclist D: Unhealthy Environment, right) are examples of environments depicting evidence of human influence.

Evidence suggests that environments perceived as unhealthy or least favorites are more likely to be located in city or urban environments; thirteen of the nineteen photographs (roughly sixty-eight percent) representing these two categories were located within urban areas of Watauga County, which are in and around the town limits of Boone. (See Figure 4.10 for details). Similarly, photographs depicting buildings, urban scenes, and evidence of high human development and traffic were typically characterized negatively; seventy-five percent of the twenty-four photos showing this type of landscape were categorized as unhealthy or least favorite environments.

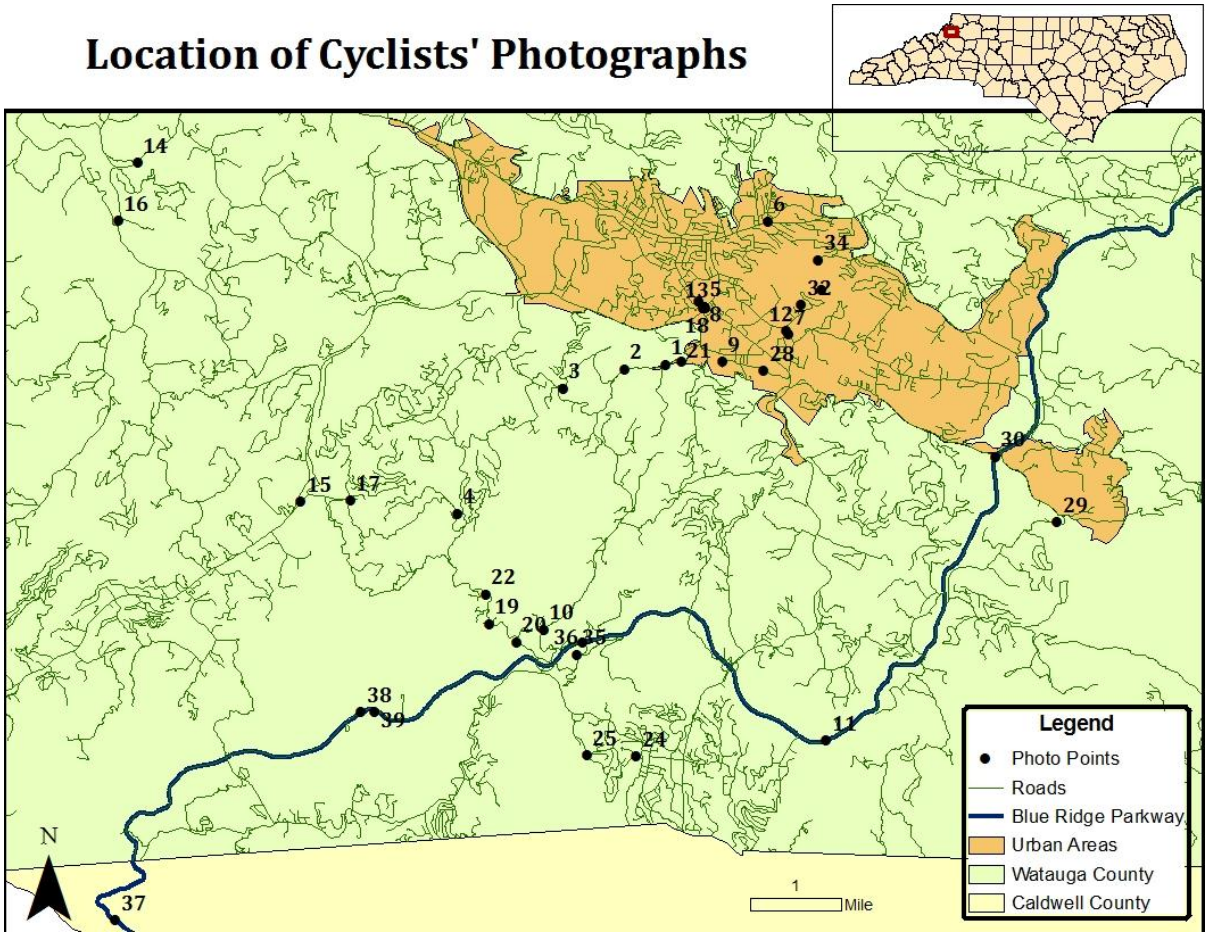

Figure 4.9 Map of Location of Subjects' Photographs in relation to urban areas in Watauga County, NC. See Appendix J for additional maps generated from GIS.

The spatial analysis of photo locations, shown in Figure 4.9, suggests that the subjects as a group are more inclined to denote urban environments as unhealthy and more rural or "country" environments as healthy. Specific comments from the interview material back up this claim. For instance, Cyclist C says, "I feel like the environment is healthier outside of the city, so I tend to go out there, rather than stay in the city." This trend is likely due to the increased visible impact of human use within urban areas. For example, Cyclist H says that there is "too much concrete" in urban areas to be healthy, and prefers a "natural feeling… where there's woods" to represent healthy environments. Other subjects have similar feelings about the separation of humans and nature, reflecting that healthy natural environments appear untouched by humans. Cyclist I contends that he likes to be in places exhibiting qualities of a healthy environment, such as "places where there's no buildings or people; it's just nature." Additionally, Cyclist E states that he likes environments that appear healthy, which to him means, "things that haven't been messed up by people."

These sentiments likely relate back to the traditional ideas and definitions of *nature* that are characterized by the "us vs. them" mentality as discussed by Flores and Clark (2001). Thus, a healthy natural environment should appear untouched by humans, following this philosophy. Emphasis is placed on the *appearance* of these landscapes in particular. Cyclist D offers this statement about appearance: "I think that when people think of something that's environmentally healthy, it just naturally looks healthy. If it looks healthy, chances are that it's going to be healthy." Statements from the other subjects are consistent with this sentiment; five of the nine participants specifically discussed the importance of appearance when distinguishing the state of

environmental quality. These subjects made statements similar to Cyclist E's comment, that, "It just looks healthy."

The aesthetic appeal of many of the photographed environments caught the attention of the subjects. This was especially the case for the favorite environments. Seven subjects picked environments based on the scenic aesthetic appeal, such as environments depicting ideal landscapes as noted by Gobster et al. (2007), Parsons and Daniel (2002), and Nash (1982). For instance, Cyclist A describes his favorite landscape:

> It's just a little clearing where you can see fields and more mountains way off in the distance, and there's trees, and there's cows mulling about. Even in the wintertime, to come around and see this field covered in untouched snow is very pretty. It's picturesque. It's postcard-esque. You could take this picture and stamp it on a postcard and send it to your friends, and say, 'I've been here,' and they'd be jealous, because it just looks good. It looks like a place you want to be.

Similarly, Cyclist G speaks of her favorite landscape as, "just like a country scene. You know, something you would see in a painting." This type of aesthetic preference is common within the literature and follows expectations. One subject, however, demonstrated an ecological aesthetic, and valued landscapes based on their ecological function. For example, despite the picturesque scene of a golf course, Cyclist D categorized this landscape as environmentally unhealthy, based on his knowledge of golf course practices and educational background in biology. This type of interpretation is also closely associated with concepts such as visual literacy and sense of place, which includes any education, personal knowledge, and perceptions of a particular place on an individual basis.

Sense of Place

Sense of place tended to drive the perceptions of the landscape in and around Watauga County. Six of the subjects noted the importance of sense of place as a driving factor in their photo decisions, especially of favorite environments. The landscape of the Blue Ridge Mountains carries expectations of what the environment should look like, and the subjects seemed pleased to discuss these visual qualities. Subjects tended to enjoy environments that they deemed to be representative of the ideal mountain landscape. Cyclist D, speaking of a photo of Grandfather Mountain, stated:

> It's an iconic shot for the high country area. It's like the mountain that people go to, to enjoy hiking or to bike around, because of its notorious difficulty. So I took a picture of this as my favorite spot, because it's a symbol of where I live right now, and it's a symbol of what the high country is about. It's about mountain vistas. It's about gorgeous scenery.

Cyclist B mentioned a similar sentiment about his favorite place in the following: "It's a good view of Boone and it's… what I imagine Boone to be, which is just like a nice little town in the mountains, you know, with good views." These sentiments held value in the sense of place associated with this environment. The subjects found enjoyment when these expectations were met. These opinions may be related to the subjects having resided in Boone for a very short time – less than 3 months for many of the subjects. They are still focused on their preconceptions of the area; their favorite environments might change with increased exposure to the area and as the new landscape becomes ordinary.

Another subject made connections between sense of place and environmental perception. For example, Cyclist G discussed how her memories of family socialization guided her perceptions in choosing healthy and favorite landscapes. She says, "I just

looked over and there was farmland, cows grazing, and it's like everything is healthy and vibrant colors and stuff. It just appealed to me… because my grandparents are farmers." This supported other research on sense of place that claims the importance of community, socialization, and personal connections when perceiving a landscape and creating attachment (see Kyle and Chick 2007; Kerstetter and Bricker 2009; Amsden, Stedman, and Kruger 2011). It suggested that there is more to perception than what is on the visually apparent and on the surface.

Conclusions

While perception of environmental quality does appear to play a role in the places people choose to be (and the routes cyclists choose to bike), evidence for choosing to be in healthy environments is somewhat more complicated. Many subjects stated a close relationship between perceived environmental quality and their favorite locations, and preferred to be in these places, even sought them out as destination points. However, some participants seemed more focused on avoiding unhealthy environments. Yet, it seems uncontrollable that people will encounter unhealthy environments, even if they strive otherwise.

Additional findings within the results relate to how people view and perceive environmental quality. One subject exhibited anthropocentric views, while one subject exhibited ecocentric views, and the rest of group (7) displayed biocentric viewpoints. The biocentric and anthropocentric views were expected, although the majority of the subjects favored biocentrism overall. However, the ecocentric viewpoint is less common within the literature.

Findings from the research suggested that healthy and favorite environments carry similar qualities, such as aesthetically pleasing scenery, a "natural feel," and an absence of people and evidence of human influence. These places tended to be in rural or non-urban settings. On occasion, these positive environments were associated with sense of place, suggesting that subjects were pleased with places that reflected their personal views of what a mountain community is and how it should appear. Conversely, least favorite and unhealthy environments were more likely to be in urban areas, exhibiting much human influence, such as buildings, automobile traffic, and natural areas that had been clear-cut or otherwise negatively altered for human use. These findings were consistent with traditional ideas of *nature* and its health, as well as landscape aesthetic preferences (Lamb 1996; Gobster et al. 2007).

CHAPTER 5

CONCLUSION

Several patterns emerged within the data, but results only scratched the surface of some of the broad and controversial issues concerning environmental perception and related topics, such as landscape aesthetics and sense of place. It is important to note that this research was conducted on an exploratory basis, with a limited scope and budget. Given more time, funding, and labor, further analysis could be conducted, possibly producing more profound results.

Review of Findings

The most interesting findings pertain to the main research question of "Do people choose to be in places that they perceive to be environmentally healthy?" Secondary inquiries into how people perceive the environment, including the basis for environmental concern, as well as trends in perceptions of healthful environments and landscape preferences, yielded interesting results as well. Environmental quality appears to play a major role in the places where the subjects chose to be. For some this meant seeking healthy environments, while for others it meant avoiding unhealthy environments. Even though many people sought healthier environments, it was inevitable that they experienced negative and unhealthy environments while in transit, due to transportation restrictions and the nature of the built and urban environments.

Environmental perception was centered on biocentric viewpoints for the majority of the subjects. However it was obvious that within this group of people, there were serious concerns for the environment as a whole and in its own right, placing human concerns as a secondary matter in environmental quality. Indeed, one subject was completely focused on ecocentric values, which is not discussed in the literature as commonly as anthropocentric and biocentric values.

Expectations and preferences of environments remain among the traditional viewpoints commonly discussed in the literature. This includes traditional ideas of nature in environmental quality, such as the separation of humans and nature, suggesting that healthier environments are outside of urban areas and human influence. Similarly, there is an emphasis on the appearance of a landscape as an indicator of health, and the scenic aesthetic remains the status quo among the majority of the subjects. However, one participant valued landscapes based on the ecological aesthetic, due to an educational background in biology.

Future Research

Because of the small scale of this study, more in-depth research should be conducted to fully examine these major findings. For example, future endeavors should increase the sample size and include a variety of comprehensive age groups. This would enable testing for generational differences in environmental thought. Another related demographic factor to include and examine in future studies is religious affiliation. As Winter (2007) notes in her study on environmental concern, spiritual influence can be a major factor in individual values, and Christianity is of particular

interest because it is the "most anthropocentric religion the world has ever seen." This may be especially relevant in studies in the United States based on the prevalence of Christianity. These additions may provide more insight into the possible shift toward ecocentric views. This type of increased scale and sample size may require additional help from other researchers during analysis. Additionally, it might be beneficial to use analysis software.

There are other issues that could be addressed in future studies on other topics related to this research. For instance, this study could easily serve as a jumping off point for a dissertation or other thorough inquiry into perceptions of environmental quality and health. I would like to research the dialectic between perception and reality, especially associated with environmental quality. For example, Rider E talked of areas visible from the Blue Ridge Parkway as healthy because they were devoid of human influence, communities, and people in general. However, this is not the case. Several organizations, including the Conservation Trust of North Carolina, are responsible for protecting and creating the viewshed of the Parkway. They ensure that human influence, other than passive use – such as pastures for grazing livestock – is not visible within the viewshed. Human influence created this landscape, carefully regulating and hiding unwanted imagery. Another example includes people enjoying Christmas tree farms and regarding them as healthy for the environment, because they are trees. In reality the tree species may not be native and the amount of pesticides and fertilizers required to produce perfect trees is substantial and pollutes the water systems. It would be interesting to delve into this apparent disconnect between perception and reality on a deeper level. This type of research would require an

expanded amount of time and resources, as well as a greater understanding of ecological processes. It might also benefit from collaboration with researchers from other disciplines.

Concluding Thoughts

This exploratory research provided some expected as well as unexpected results about the nature of environmental perception and related behaviors. Hopefully, this study sparked an interest in the environment among some of the subjects that will translate into increased conservation efforts and environmentally conscious behavior through place attachment. Indeed all but one participant said they would think about their experiences and environmental quality in the future. One participant even noted a desire to become more active in the community and take action to change it for the better, promoting healthier environments. Thus, perhaps this study has some positive effects for the community at a small scale. And hopefully the findings of this research will have lasting effects as well.

Upon completion of this thesis I have gathered some valuable information to aid future endeavors and dissertation work. One of the most noticeable lessons stresses the importance of the process involved in scholarly research, including the proper order of developing a research question, research design, and implementation. Additionally, having a well-defined and solid research question is key to maintaining focus.

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APPENDIX A

INTERVIEWEE CONSENT FORM

I agree to participate as an interviewee in this research project, which concerns "Outdoor Recreational Experiences: Cyclists' Perceptions of Environmental Health, Natural Beauty, and Satisfaction of Bike Routes," and occurs in the summer/fall of 2010. I understand that my interview will be audio-taped, transcribed, and used for a Master's thesis to be conducted by Amanda W. Roberts of Appalachian State University's department of Geography and Planning. I understand that there are potential physical risks associated with the bike-riding portion of my participation. I also know that this study may aid in the planning and design process of future recreational facilities, as well as support local constituencies for conservation and promote environmental health.

I will obey all applicable traffic laws and bike during day light hours, on familiar routes. In addition, I am encouraged to bike in small groups, as well as to carry a cell phone or other contact device in case of an emergency situation requiring medical or other attention. Furthermore, I will completely stop, in a safe location, and dismount the bicycle in order to take photos. I am asked to take four photos in total, including one of each of the following: a favorite landscape, an environmentally healthy landscape, a least favorite landscape, and an environmentally unhealthy landscape.

I give Amanda W. Roberts ownership of all photos, tapes, and transcripts from the interview(s) she conducts with me and understand that photos, tapes, and transcripts will be kept in the researcher's possession. I understand that information or quotations from tapes and/or transcripts will be published without identifying information. I understand I will receive no compensation for the interview.

In signing this form, I acknowledge that I am over the age of 18. Also, I understand that my participation in the project is voluntary and I can end it at any time without consequence. I also understand that if I have questions about this research project, I can call the researcher at (828) 262-3000, the faculty advisor (Dr. Jana Carp) at (828) 262-7091, or contact Appalachian State University's Office of Research Protections at (828) 262-7981 or irb@appstate.edu.

_____	_____
Name of Interviewer (printed)	Name of Interviewee (printed)
_____	_____
Signature of Interviewer	Signature of Interviewee

_____
Date(s) of Interview(s)

APPENDIX B

PHOTO INSTRUCTIONS

Please take four (4) photos of the natural environments you encounter while on your bike ride. You should have at least one photo of each of the following categories:

1. a favorite landscape
2. an environmentally healthy landscape
3. a least favorite landscape
4. an environmentally unhealthy landscape

Be sure to think about why you chose a particular place to photograph. For example, why is this place or landscape your favorite area on the bike route? Or what particular characteristics make an area environmentally unhealthy in your opinion? Reflect on your overall experience. Remember that these photos should be based on your own beliefs and ideas of the environment.

EXERCISE CAUTION

Consider safety first! Be sure to dismount your bicycle and move to a safe place –out of traffic and preferably off of the road – when you take a photograph. Obey all applicable traffic laws, wear a helmet, and carry a cell phone or other contact device in case of an emergency. Be aware of your surroundings, and be courteous to other people on the roads.

PHOTO TIPS

- THINK THROUGH THE PHOTOGRAPH. Why are you taking it? What are you trying to show? Be sure the important elements of the picture are prominently featured.
- FILL THE FRAME. Make sure there aren't distracting elements in the picture.
- BE SURE THE SUBJECT IS WELL LIT. Make sure that the important parts of the picture are not in shadow. Over cast days are good days for even light.
- DON'T FACE THE CAMERA INTO THE SUN. Sunlight can flare off the lens; shadows and too much light create problems with the final photograph.
- HOLD THE CAMERA STEADY. Camera movement can blur the image.

APPENDIX C

INTERVIEW QUESTIONS

Rider: _____

Ride Date: _____

Interview Date: _____

Rider Bio

Age: _____

Gender: _____

Occupation: _____

Major (if student): _____

Hometown: _____

Rider level: _____

Rider experience: _____

How long have you been riding in the Boone area?

_____

How did you get into cycling?

Interview Questions

(1) What are some of the things you look for in a good bike route?
(2) Does environmental quality play a role in choosing favorable bicycling routes? What about natural beauty or scenery?
(3) Do you think that your favorite riding environments have similar characteristics?
(4) What makes a route unfavorable?

(5) Why is this particular route the one you chose to go on this day?
(6) Did you bike alone? In a group? With a buddy?
(7) What general direction did you go in?
(8) How long was the ride in time? In miles?

Pictures

(1) Let's go over each of these photos individually.
(2) Why do you think this scene depicts a healthy/unhealthy environment?
(3) Why is this your favorite spot/ least favorite spot on the ride?
(4) Do you think that taking the pictures helped you to reflect on your environment and your experiences within it?

APPENDIX D

EXAMPLE PHOTO FLASH CARD

Photo ID: 35 Cyclist I (photo 2) Unhealthy Environment

(Front)

X: Let's talk about the next one. This is a picture in photo two. What is this a picture of again?
I: I forgot the exact name of the house, but it's just a manor house on the parkway. And from Bass Lake up to the fire tower is where I do most of my runs, and that ride goes past it. And throughout the fall season, I'd see all the like, I guess you'd call them leaf watchers, and all the people from Florida just drive up and clog the Parkway. You know, I never really liked seeing them. It's kind of an annoyance to me. People just wasting, I mean not wasting gas, but eating a lot of gas just to go look at a house. It seems kind of wasteful.
X: Okay, so this is your environmentally unhealthy picture?
I: Yeah, just because I run or bike there pretty much every other day and see that house, and during the fall season when all the leaves look nice, there are just so many cars from like Florida and faraway places just to go see a house. I didn't like how it attracted so many of those people.
X: Okay, so you don't like the people in general?
I: Yes. I mean they just drive somewhere, get out of their car, go look at the view, and get back in their car and drive. I like to, you know, people should have to hike somewhere. You know, use their bodies to get to the good view, not just drive around and waste gas.
X: So you think it's a bad use of environmental resources?
I: Yeah, it's just like people who go look at this big fancy house. I don't know; I disagree with it.

(Back)

Photo flash cards were used to examine patterns among the photographs in connection with the transcripts. For example, this photo depicts a house, which displays human influence on the environment. The subject's commentary labels this environment as unhealthy due to human impact. He states that this environment is exemplary of people wasting or "eating a lot of gas," which he disagrees with. This information falls into the category of humans negatively affecting the environment, which is then compared to other subjects' commentary.

APPENDIX E

SAMPLE INTERVIEW TRANSCRIPTIONS

Cyclist: D
Interviewer: Amanda (X)
Interview Date: October 12, 2010
Recording: A 05

X: Let's talk a little bit about your cycling experience. How long have you been biking?

D: Competitively?

X: Yeah, we'll go with that.

D: Three years.

X: Okay. And how long have you been riding in the Boone area, specifically?

D: Two years.

X: How did you get into cycling to begin with?

D: I got a job as a bicycle mechanic at a shop in my hometown, and when you're around bikes every day, you incorporate them into every aspect of your life. I was an athlete in high school, and then came to Appalachian, and didn't really have a sport, so I joined the cycling team.

X: Okay great. So is it that you wanted a sport or you wanted something for exercise? Or is it just recreation?

D: It was a little bit of everything. I use it for transportation back-and-forth from class to my apartment and then I do it for exercise, because I don't like running. And then I do it for the social aspects, you know.

X: Okay great. Let's talk a little bit about the ride that you did for this project. So why did you choose to go on this route on this particular day?

D: This route, on this particular day is right at an hour long, and its right at 30 miles. And it's got one 20 min. climb in it, and when I'm crunched for time, I'm looking for a ride that is tough and not too long, and at the end of this ride I always feel like I've accomplished something. So this is like my "go to" ride, if you will.

X: So it's a hard ride? Is it like a training ride?

D: Yes, I definitely consider it a good training ride.

X: And you said there is one climb?

D: Yes, there's one sustained climb, right at 20 min. long.

X: Okay great. And did you go by yourself or with a group?

D: I did go by myself.

X: Okay. And where did you go exactly? Like what general direction?

D: I went Highway 421 towards Tennessee out of Boone, and then a left onto 194 to Valle Crucis. Then 194 turns into Broadstone Road. That will take you out to Highway 105. A right onto Highway 105, and then you'll turn off onto Shulls Mill Road at Hound Ears Club, which is the number eight at the golf course. And then you'll go up Shulls Mill Road, which is the climb. Then Shulls Mill Road to Flannery Fork, and then Flannery Fork back down into town via Winkler's Creek Road.

X: Okay, so you were on some major highways.

D: Yes, for a little while. Highway 105 is a short 5 min. section, but it's nice because it has a fairly broad shoulder. So that's not as bad. And then 421 out of town can be a little bit dicey.

X: Okay and the golf course is photo six, and the intersection for your least favorite environment is photo eight.

D: Yep, That's correct.

X: Okay great. Let's go over each of these pictures individually then. Why don't we talk about your favorite landscape, which I have as photos three (and four really). There are two shots of this, so this is near Grandfather Mountain?

D: Yep, this is a view of Grandfather Mountain from Shulls Mill Road, and it's framed by a couple other trees and a nice field and its right at the bottom of the climb before you go out Shulls Mill.

X: Okay, so what is it in particular that you like about this place?

D: You are riding along, and you're mentally preparing to do this climb and all of a sudden there's a break in the trees and you see this profile shot of Grandfather Mountain. It's an iconic shot for the high country area. It's like the mountain that people go to enjoy hiking or to bike around because of its notorious difficulty. So I took a picture of this as my favorite spot, because it's a symbol of where I live right now, and

it's a symbol of what the high country is about. It's about mountain vistas. It's about gorgeous scenery.

X: Okay, and you mentioned that you see this right before the climb. Is that something you look forward to before you get to that climb?

D: Yes definitely. I'd say the first time I did this ride, I actually stopped and got off the bike, and was just kind of taking it in. And now every time I go on the ride it's like, "Grandfather, here we go, get ready to do this climb, I'll see you next time" kind of thing.

X: Okay, so it sounds like a little treat for you.

D: Exactly, because you don't always get out to see mountains like this, like during town every day you can ride around town but you don't always get a view of Grandfather, and I think that the fastest way to get that particular view is on this particular ride.

X: So would you say that this then is kind of something spectacular in the ordinary? Like it's your ordinary ride, it's your everyday sort of experience, and all of a sudden you see this? That's what we're getting at?

D: Yes.

X: Okay that's great. Let's move on to your least favorite environment then. We'll talk about that in contrast, which is photo eight. So tell me where this is.

D: This is at the intersection of Highway 321 And Hwy. 105. It's right there in the middle of Boone. If you live in Boone, you've dealt with this intersection. And I took a picture of this as my least favorite landscape, because I'm coming back into town, I'm tired, and dealing with this intersection on a bike is tough. You know, let alone in a car, it's tough. So I was waiting at this intersection long enough to get the camera out of my jersey pocket to take a picture, and that can tell you, you know you're surrounded by cars, breathing in exhaust, and it's just not a very appealing place to be.

X: Okay so you don't like… Obviously there's the time factor there, because you're sitting there long enough to take a picture.

D: Right. So it slows me down, and you just don't feel good sitting at this intersection healthwise.

X: Because of the exhaust?

D: Right.

X: Okay, are there any other reasons?

D: Well safety. I mean you're sitting in turning lanes of traffic and you've got cars in front of you and behind you, so safety is probably another reason why I don't particularly like this place, because you don't feel very in control of your own… You're hoping the other cars will respect your space and respect your safety, but that doesn't always happen.

X: Right, you're right. And this particular spot is pretty popular in the area of places that cyclists take to be in the area. So that's perfectly understandable. Okay, well that's great. We've gotten some good stuff so far. So let's talk a little bit about environmental health. Let's start with photos one and two, which are the same place. So tell me a little bit about this place.

D: This is a family-owned farm off of, or it's right on Highway 194 before you get into Valle Crucis. And the pictures don't do it justice. It's at the end of the growing season now, so everything has been picked over. But this summer when I rode this route, probably about once a week, you could kind of track the progression of things starting to come up out of the ground, things starting to bloom. In the harvest season in late summer, I was actually stopped by the family out there when they were doing summer squash picking, and they gave me some because they had too much. So it was really nice, I met them and they told me a little about their farm. They sell at the local farmers market in town on Saturdays. So I guess that there's a personal connection here. So they do all organic farming. They don't use any synthetic petroleum based products on their farm, which is a more environmentally sound way of doing farming, and then they are a local farm. So getting your food locally is a huge environmental health benefit. And as a cyclist you can identify with that, because the further away your food comes the more junk that gets put into the air. And then nobody likes to breathe dirty air. This is what I think of when I think of environmental health. It's like a small-scale farm, minimum impact, minimum transportation to table, if you will. And that's what I think of.

X: Okay that's great. So, it sounds like in this picture what we see is a small farm, and you can see that there are different rows of different crops, so it's obviously small-scale. But just for your average rider they may not know the things that you know about this place through your personal experience. So it sounds like the personal connection is a big part of this. The fact that you know about the land in general. Is that safe to say?

D: I think so, yes.

X: So the environmental health component then is about…

D: Healthy food and low impact on the land and the atmosphere as well.

X: Okay, so that's like transportation costs, price and things like that. Okay, that sounds great. So we have another environmentally healthy photo in here, which is photo five.

D: Right. Photo five is a picture of a Creek that is on Highway 194 as well, near the farm that we were just talking about them photo one. The stream is clear. It is fast flowing.

It's got a healthy bank on either side, and I guess it's easy for me to pick out environmental health because of my education background. So I see… I think of species biodiversity as high in aquatic environments, and water can carry toxins a further distance, and faster than they can travel in the air. So having clean streams is important. I think that when people think of something that's environmentally healthy it just naturally looks healthy. So then it doesn't look like its doing very well, it'll look decrepit or kind of junky with trash there. And there wasn't any trash in photo five. The water's clear, it's not cloudy. And that's how I labeled it environmentally friendly.

X: Okay, so your background in environmental biology is playing a big role here.

D: I think so, yeah.

X: And you're also saying that typically there's a connection between the appearance of a place and its health.

D: Sure, yes.

X: And that it can be obvious sometimes.

D: Right. It can be obvious. If it looks healthy, chances are that it's going to be healthy. Streams are difficult, because water can look healthy but you need instruments to actually measure it.

X: Okay that's great. You've made some great points here. The last photo to discuss is photo six (and also seven) for your environmentally unhealthy landscape. And this is a golf course. Correct?

D: Yes. This is the Hound Ears Club golf course on Shulls Mill Road. I saw this as an environmentally unhealthy landscape for a couple of reasons. Golf courses require an incredible amount of resource input, so water resources and fertilizer and pesticide resources. So they need to keep their grass healthy, and they do that by watering it a lot and putting stuff on it to make it grow. And by keeping rodents and small mammals and bugs out of their property. And it's deceiving, because it looks lush and green, but when you think about what it takes to make it lush and green, you realize that a lot of those chemicals and fertilizers will just run off into mountain streams, like in photo five. And it can be just as devastating to environmental health.

X: Yes, I completely agree with you. I was very excited when I saw that you took pictures of the golf course. I had a feeling it was for your unhealthy environmental photo.

D: Yes.

X: And also, in a lot of cases, this grass is clearly not a natural state of vegetation for the area.

D: Oh definitely. Yes, how many mountain fields do you see with lush green grass? Not very many. Right, I would agree with that as well.

X: Yeah, well this is great. I'm really pleased with the pictures that you've taken. These are great examples.

D: Sweet. I'm glad they worked out.

X: So let's talk a little bit about your experience overall. Do you think that taking the pictures helps to you to reflect on the environment that you ride through and your experiences and that sort of thing?

D: Oh for sure. You have to stop to take the pictures, which is step one. And usually when I go for a ride about 90% of the time it's because I want to get some fitness out of it. When you're pushing hard and you are just trying to complete your loop or complete your ride, you kind of mistake the forests for the trees. You see it, but you don't really see it. And I think by taking the pictures, and thinking about categorizing the pictures into the four categories, you kind of map out the places that you can recognize as healthy or favorites. And you also can recognize unhealthy or least favorite places. It's a lot easier by using the pictures to categorize them.

X: Let's talk about biking in general. So aside from this route, what do you look for in a good bike route in general?

D: In a good bike route, you're looking for… I look for primarily, its traffic. I will look for routes that include secondary roads and back roads, primarily instead of main roads or highways, just for the sake of being out of the way of cars. That way I decrease my chances of getting hurt, you know with a vehicle. I also look for difficulty of the route, so depending on what kind of ride I want to get in, I can choose a harder ride or a longer ride, and then if I want to get something quick and fun in, I can do something a little less challenging or shorter, like less mileage. So traffic and distance, I guess the third deciding factor would be if I hadn't been to an area in a while… Like if I hadn't been up on the Parkway for a while. I say, "well I'm going to go ride on the parkway, because I haven't been up there in a while and I need to go back. I need to go see that."

X: So you say, "you need to go see that." Does that mean that the scenery or the landscape plays a role in this?

D: It does. I think that being in a place that you enjoy, while exercising is a bonus. It just makes it that much more enjoyable, when you're happy about where you are and you appreciate where you are, and I'm kicking my own butt on the bike, it's pretty rewarding.

X: And would you say that along those same lines that environmental health plays a role in the places that you choose to ride? Like, do you look for healthy environments?

D: Yes. Yes, so let's see. I'm from a pretty urban area back home in Northern Virginia and it would be tough to find a picture of an environmentally healthy area if I had done the right there. We are fortunate in the high country, because the rural environment allows us to escape, if you will. Boone is like a hub, and then as a cyclist you can escape into the countryside to enjoy views and quiet and escape from just traffic and, you know, the hustle and bustle of town.

X: Right. Those are some good ideas. Well, that's most of the questions that I have. Is there anything else? Is there a big picture idea that you take away from this experience? Or anything else you'd like to add?

D: Well, I think that I feel that I gained an appreciation for… So, it's an everyday thing for me to ride, and it's an everyday thing for me to encounter all four types of these pictures, but taking the time to say that Hound Ears is overwatering their golf course, how can I make that change? Or how can, you know Grandfather looks really good today, but some days it's hazier and you can't really see grandfather that well from that particular point. So how can I make that change? It really just made me want to become more active in my community, because when you take a picture it lasts forever. And you make a memory out of it, that's when you really connect with the place to a condition or community. And I think that that's important. First and foremost is that, you're riding your bike and you're out in these communities, so why not take action to change them for the better? That's probably the biggest picture or the take-home message.

X: Okay, well that sounds great. I'm going to go ahead and stop this.

Cyclist: E
Interviewer: Amanda (X)
Interview Date: October 12, 2010
Recording: A 06

X: Tell me a little bit about your riding experience. How many years have you been biking?

E: I used to race mountain bikes back in middle school, and a little bit in high school. In high school I was more into soccer, and I kind of went away from cycling. Then I came back to App and there's a big cycling group up here, and I got back into it. It really caught fire, and now I'm addicted to it again.

X: Okay so you've been racing since middle school?

E: Yes, at least on the mountain bike.

X: And how long have you been riding in the Boone area?

E: Since I got up here, in last August of 2009.

X: Okay so a little over a year?

E: Yep.

X: And I'd like to ask you how you got into cycling in general.

E: One of my friends raced mountain bikes, so they were always going on the weekends and racing, and I thought it would be fun to tag along and join them. So a lot of my friends got me into it at an early age. And I just kind of stuck with it.

X: Do you like the competition aspect of it?

E: Yeah. It's one of the reasons I played a lot of sports and ran in high school. I like to compete and I like the pain of endurance sports.

X: Do you like the exercise component too?

E: Yeah. For sure.

X: What about just for recreation, or just for fun?

E: Yeah, it's fun sometimes, but when you race and you train it's still fun.

X: So it doesn't play that much of a role?

E: Yeah.

X: Okay. Let's talk about the ride that you went on for this project. Why did you choose to go on this route on this particular day?

E: Well, this was actually one of my first road rides in Boone. Up Winkler's Creek to Russ Cornett, Shulls Mill, and little bit of Poplar Grove. So I've always kind of gone back to it, because that's where I started. It's got a lot of climbing and good views. It's a long route and you get a mixture of everything.

X: So it's something you're super familiar with and you enjoy it.

E: Sure.

X: Did you go alone or in a group?

E: I was alone. Just getting a ride in before the weekend, before racing.

X: Can we talk a little bit about the general direction you went in? So where did you go exactly?

E: I started off going up Winkler's Creek, and then Russ Cornett up to Poplar Grove for a little bit and then to Shulls Mill. Then you take Shulls Mill all the way back to Blowing Rock.

X: So how did you get back into town?

E: I came back over Deck Hill by the ski resort, but all the photos are taken up Shulls Mill pretty much.

X: And how long was the ride timewise?

E: An hour and a half.

X: And how long do you think you went in mileage?

E: 25 to 30, maybe. Somewhere in that range.

X: Sounds good. Let's talk a little bit about each of these pictures. So, picture one is your healthy environment picture. So tell me a little bit about this picture. Where is this?

E: This is probably about 2 miles from the top of Shulls Mill, and I thought it was healthy because you got the green fields and there's flowers that bloom and stuff; all the leaves are changing. So the trees are healthy, changing with the season and stuff, and the blue sky. It just looks healthy and luscious life. So, yeah, that's why I picked that one.

X: So you think it's healthy, because it looks healthy? Like the scenery?

E: I think that's healthy, like all the colors like its changing.

X: You like the colors? So, the appearance of health…

E: Yes, it's the appearance of health for sure. It looks "lifey."

X: Okay. So let's see what's next. Next we have your favorite landscape, then what is it that we're looking at right there?

E: You can see Grandfather Mountain, and I guess all of the valleys between that, and it's after you go over the top of Shulls Mill, and then like in Wonderland, I think is what it's called, a big nice neighborhood, and there's like a little rock you can stop at. And I liked it, because you can see Grandfather and like forever, and everything is blue this time of year. So it's a good view of a wide area.

X: So you like the fact that you can see far away?

E: Yeah. And lots of different mountains ranges, especially Grandfather, and all the ones in the distance.

X: I'm not really seeing any houses or anything in this picture. Does that mean something to you?

E: Yes. It's cool to just see natural landscapes, without buildings being in the way and stuff. No commercial use.

X: Okay, so without seeing the human influence.

E: Yeah, it's a natural look.

X: Right, so it sounds like there's a lot of similarities in your favorite landscape and your healthy environment then.

E: Yeah for sure.

X: You think that you like environments that appear healthy?

E: Yeah, just things that haven't been messed up by people.

X: Okay, so it's an absence of human impact.

E: Yeah and cleanliness I guess.

X: To what extent do you think does scenery play a role in your route choice?

E: A pretty good bit. I mean part of the reason I'm in Boone too, is that it's a good place to ride and because of the natural surroundings we have a lot of people, come up here to ride as well. More so than other places, because a lot of other stuff just doesn't compare. A lot of flat roads at home, and then you come here for different scenery and you know what you're going to see.

X: So you like that it's not flat, and you like the hills?

E: Yes, I like the hills.

X: And the mountain environment?

E: Yeah. For sure.

X: Does that play a role in training for you?

E: Yes, any time you can train at altitude, and with hills it helps out a lot I think.

X: Okay good. Well, let's go to the next one then. Tell me a little bit about where this is and describe what you see in the picture, and what that means to you.

E: This photo is off Winkler's Creek, and you're riding on the road and there are lots of big rocks everywhere, and there's just graffiti all over this rock, where somebody spray painted all over it and stuff, and just messed up the natural environment, by spray painting. So it's messing up nature, I guess.

X: Okay, and this is your least favorite spot?

E: Um hmm. Yeah, it's because everything is pleasant outside, and somebody spray-painted this in the middle of everything that's nice.

X: Okay, so, its graffiti, and it's like somebody defaced the environment.

E: It's not even on a building, it's just on a random rock in nature. So it's weird.

X: Was it near houses or anything else, or was it…

E: Similar, but it's kind of in a turn, and it's just an odd spot for somebody to graffiti a rock, if that makes sense.

X: Sure

E: Right, and the rest of the environment looks fairly natural.

X: Let's go on to the fourth photo. This is your unhealthy environment. Is that right? So where is this?

E: This is right after I got off of Poplar Grove, and took a left onto Shulls Mill. It's on the second half of Shulls Mill. And it's just a lot of erosion, and rocks falling into the road, which is also dangerous for cyclists coming around the turn. And I guess, even since last year, it keeps getting worse. More stuff is getting eroded, and more roots and rocks are washing into the road and stuff. So I've noticed that.

X: Really? Okay. So you think it's unhealthy for the environment that the erosion is sort of knocking down all the rocks?

E: Yes, and it just keeps pulling everything with it. The erosion keeps spreading farther back from the road, growing and growing.

X: And this is also unhealthy for you?

E: Yes. It's a dangerous spot sometimes. The gravel, yeah, and roots get washed down and stuff.

X: Okay well also it seems like there are a lot of similarities in your unhealthy environment and your least favorite. And it seems all so like you don't like to see human impact on things. Is that true?

E: Yes, just not in a negative way.

X: Well, what's the difference there? What is a negative way? And what is a positive way?

E: It's just like picking up after trash and protecting things that are in our power to protect. If we can fix it, try to. And if it's natural, just let it happen I guess, but some things we can stop, I guess, that we're not stopping.

X: So maybe conservation efforts, and things like that are positive human influences?

E: Yes.

X: Well, that all sounds good. I guess that's it for the pictures. So let's talk a little bit about the experience. How do you think that taking the pictures helped you to reflect on the environment and your experiences within it, and the way you look at it and that sort of thing?

E: Yeah, for sure. I mean I've noticed the erosion before, but now I'm actually thinking about it, and there's more erosion and more trash on the roads than I usually notice, when you're actually looking for it, you know. You usually just kind of glance at it as you

go by, but because I was going slower today, and thinking about what I was trying to find, a lot more stuff was noticeable.

X: So you are more alert to your surroundings?

E: Yeah. Definitely.

X: Well, that's always a good thing. I know that typically when training, you're just focused on the ride.

E: Yeah, you're getting a workout done.

X: Right. Do you think that after this, and because of this experience, you might pay more attention to the environment, and be more alert when you go on bike rides?

E: Yeah probably. And I will probably point it out to people who are riding with me. And show them, so that more people are aware of things like this.

X: Okay. Let's talk a little bit about your views of biking in general. What's something that you look for in a good bike route, generally?

E: Just varying terrain, and different stuff, like some flat, some hills, curvy roads, good views. Routes that I know there are not a lot of loose dogs on. Those can end up bad. And I guess how the weather's going to be on the route and the ride, so you know what to expect before the ride is nice, to prepare for rain.

X: Okay and those are all environmental factors. What about traffic and people?

E: Yeah I try to… a lot of the back roads I know are less traffic and stuff. But I also like to stay on roads that at least have something, in case something happens. So it's kind of tough to pick something that's not too isolated, but at least has something going on. So you don't feel unsafe.

X: Right. What then would be a really unfavorable ride?

E: You know, when you're like on 421 or 321 because of the four-lane highway, and cars on the highway are not always paying attention as much, and you're not going as fast, and they're on cell phones, so I tried to stay off the highway as much as I can. But sometimes you have to use it to link other stuff together.

X: Right, safety is a big issue. And sometimes it's hard, because you do have to ride on big roads to get to some of the smaller ones.

E: For sure.

X: Okay, let's see what else. Well, we've talked about most of this. We talked about environmental health and its role in where you ride, and its relation to the places you like in scenery. Do you think that beauty or the aesthetics of the environment, like how pretty and clean and neat it looks–do you think that affects the environmental health? Are they related? Or can they not be related in some cases?

E: I think they can be not related in some cases, but I guess they're related in most cases. At least I think so. When I look at something that's healthy, depending on how it looks.

X: So appearance is a good indication of health?

E: Yeah, I think it is.

X: So what do you think is the biggest factor in an unhealthy environment?

E: I guess the weather plays a big role only environment, like the ice messing up the trees and stuff, and then scraping messes up the roads and stuff, but I guess that's something we can't really control, because the weather is going to play its own role.

X: Okay, so you think that unhealthy environments occur naturally then, like through weather? Or do people have influence on that?

E: Well, people don't use all the caution they can. Like people plant Christmas tree farms right near rivers and stuff, and that stuff goes right into the river, the chemicals and pesticides and stuff. So I mean, people can find better places for stuff like that, and it would make things easier, but a good bit of it is natural and whether and stuff.

X: Okay. That's most of the big general questions I have. Do you think there's anything that you'd like to add? Any big picture ideas that you're taking away from this whole experience? Or anything else you want to say about it?

E: I just want to encourage more people to get out and ride, because it's fun and the weather's nice and the views are nice and it's enjoyable. And when you are climbing up the hills and you get to the top, it's like "wow." To see the views is really worth it so I just want to encourage more people to ride their bikes places, and to enjoy the outdoors, because we have such a good place for it.

X: Did you enjoy this whole experience?

E: Yes, it was a positive experience. It opened up my eyes a little bit to my surroundings sometimes. So it was good.

X: Well, I guess that's about it. I will stop this.

APPENDIX F

LIST OF INITIAL CATEGORIES AND PATTERNS

Photographs

- Popular Photographs
    1. 321/105 intersection
    2. Mountain vistas
    3. Mountain pasture scenes
    4. Environments depicting human development/influence
- Trends
    1. Healthier environments depict little or limited human influence
    2. Healthier and favorite environments depict scenes exhibiting traditional ideas of nature (as described by Lamb (1996)) and the scenic aesthetic (Gobster et al. 2007)
    3. Cars and automobile traffic are displayed negatively for reasons based on:
        a. Car emissions/exhaust
        b. Safety concerns.

Interviews

- Do people choose to be in places that they perceive to be environmentally healthy?
    1. Health tends to play a role in route choice
    2. Several people seek healthy environments while fewer people seek to avoid unhealthy environments
- Trends in Perception
    1. Biocentric views seem common
    2. Environmental quality is gauged largely on appearance
    3. Favorite environments are determined mostly on appearance as well as social factors and other personal connections

APPENDIX G

Short Answer Questions Summary Table			
Question	**Yes**	**No**	**Unclear**
Do you think environmental quality plays a role in the places that you choose to ride?	A, C, D, E, F, G, H	___	B, I
Did you go on this bike ride alone?	A, C, D, E, F, G, I	B, H	___
Do you think that taking the photographs helped you to reflect on your environment and your experiences within it?	A, B, C, D, E, F, G, H, I	___	___
Will you think about the environment and the topics we've discussed on future bike rides or in general?	A, C, E, F, G, I	H	B, D

Short answer questions were used as a simple means of gathering information to support other research questions. For example, the question, "*Do you think environmental quality plays a role in the places that you choose to ride?*" was used to help examine the main research focus. In order to gauge whether people choose to be in places that they perceive to be environmentally healthy, I first asked whether environmental health played a role in their choices. This was a direct way of examining subject's views.

APPENDIX H

SAMPLE CODING

Rider: D Date: October 12, 2010 Recording: A 05	Coding: Line 1	Coding: Line 2
X: Let's talk a little bit about your cycling experience. How long have you been biking?	Cycling Experience:	3 years competitive cycling experience. 2 yrs in Boone
D: Competitively?	3 years competitive cycling	
X: Yeah, we'll go with that.		
D: Three years.		
X: Okay. And how long have you been riding in the Boone area, specifically?	2 years riding in the Boone area	
D: Two years.		
X: How did you get into cycling to begin with?	How did you get into cycling?	
D: I got a job as a bicycle mechanic at a shop in my hometown, and when you're around bikes every day, you incorporate them into every aspect of your life. I was an athlete in high school, and then came to Appalachian, and didn't really have a sport, so I joined the cycling team.	Job as bicycle mechanic in hometown, came to Appalachian without a sport, so joined the cycling team	Used to be mechanic
X: Okay great. So is it that you wanted a sport or you wanted something for exercise? Or is it just recreation?		Bike for transportation, exercise, socialization
D: It was a little bit of everything. I use it for transportation back-and-forth from class to my apartment and then I do it for exercise, because I don't like running. And then I do it for the social aspects, you know.	It was a little bit of everything. Transportation, exercise, social aspect	
X: Okay great. Let's talk a little bit about the ride that you did for this project. So why did you choose to go on this route on this particular day?	Why this route for this project?	
D: This route, on this particular day is right at an hour long, and its right at 30 miles. And it's got one 20 min. climb in it, and when I'm crunched for time, I'm looking for a ride that is tough and not too long, and at the end of this ride I always feel like I've accomplished something. So this is like my "go to" ride, if you will.	1 hr, 30 miles, w/ a 20min. climb. I look for something not too long in a time crunch. I always feel accomplished after this ride. Its my "go to" ride	"go to" ride, w/climb
X: So it's a hard ride? Is it like a training ride?	Is it hard?	
D: Yes, I definitely consider it a good training ride.	Yes, training ride.	harder training ride
X: And you said there is one climb?	Climb?	
D: Yes, there's one sustained climb, right at 20 min. long.	One sustained climb	
X: Okay great. And did you go by yourself or with a group?		
D: I did go by myself.	Went alone	Went alone
X: Okay. And where did you go exactly? Like what general direction?	Where did you go?	
D: I went Highway 421 towards Tennessee out of Boone, and then a left onto 194 to Valle Crucis. Then 194 turns into Broadstone Road. That will take you out to Highway 105. A right onto Highway 105, and then you'll turn off onto Shulls Mill Road at Hound Ears Club, which is the number eight at the golf course. And then you'll go up Shulls Mill Road, which is the climb. Then Shulls Mill Road to Flannery Fork, and then Flannery Fork back down into town via Winkler's Creek Road.	Locations, w/ road names Some major highways? For a little bit w/ wide shoulder. 421 out can be a bit dicey	
X: Okay, so you were on some major highways.		
D: Yes, for a little while. Highway 105 is a short 5 min. section, but it's nice because it has a fairly broad shoulder. So that's not as bad. And then 421 out of town can be a little bit dicey.		
X: Okay and the golf course is photo six, and the intersection for your least favorite environment is photo eight.	Clarify photos	
D: Yep, That's correct.		
X: Okay great. Let's go over each of these pictures individually then. Why don't we talk about your favorite landscape, which I have as photos three (and four really). There are two shots of this, so this is near Grandfather Mountain?	Photo 4: F View of Grandfather mountain, framed by trees, nice field, bottom of climb	F – view of grandfather, nice, iconic
D: Yep, this is a view of Grandfather Mountain from Shulls Mill Road, and it's framed by a couple other trees and a nice field		

and its right at the bottom of the climb before you go out Shulls Mill. X: Okay, so what is it in particular that you like about this place?		
D: You are riding along, and you're mentally preparing to do this climb and all of a sudden there's a break in the trees and you see this profile shot of Grandfather Mountain. It's an iconic shot for the high country area. It's like the mountain that people go to enjoy hiking or to bike around because of its notorious difficulty. So I took a picture of this as my favorite spot, because it's a symbol of where I live right now, and it's a symbol of what the high country is about. It's about mountain vistas. It's about gorgeous scenery.	Like it because it's an iconic shot for the high country, break in the trees, symbol of where I live right now. Mountain vistas. Gorgeous scenery	Mtn vistas and gorgeous scenery important to area
X: Okay, and you mentioned that you see this right before the climb. Is that something you look forward to before you get to that climb?	Look forward to view before the climb?	
D: Yes definitely. I'd say the first time I did this ride, I actually stopped and got off the bike, and was just kind of taking it in. And now every time I go on the ride it's like, "Grandfather, here we go, get ready to do this climb, I'll see you next time" kind of thing.	Stopped and got off bike to look the first time by, icon for start of climb	View took me back, stopped to look the first time
X: Okay, so it sounds like a little treat for you.	Treat for you?	
D: Exactly, because you don't always get out to see mountains like this, like during town every day you can ride around town but you don't always get a view of Grandfather, and I think that the fastest way to get that particular view is on this particular ride.	Exactly, don't always get to see mountains like this in the everyday	It's a treat, don't see that everyday
X: So would you say that this then is kind of something spectacular in the ordinary? Like it's your ordinary ride, it's your everyday sort of experience, and all of a sudden you see this? That's what we're getting at? D: Yes.	Something spectacular in the ordinary ride? Agreed	Something spectacular in the ordinary ride
X: Okay that's great. Let's move on to your least favorite environment then. We'll talk about that in contrast, which is photo eight. So tell me where this is.	Photo 8: LF	
D: This is at the intersection of Highway 321 And Hwy. 105. It's right there in the middle of Boone. If you live in Boone, you've dealt with this intersection. And I took a picture of this as my least favorite landscape, because I'm coming back into town, I'm tired, and dealing with this intersection on a bike is tough. You know, let alone in a car, it's tough. So I was waiting at this intersection long enough to get the camera out of my jersey pocket to take a picture, and that can tell you, you know you're surrounded by cars, breathing in exhaust, and it's just not a very appealing place to be.	Intersection of 321/105. Middle of Boone. Intersection is tough on a bike – and a car, wait so long, surrounded by cars, breathing exhaust, not appealing	LF – intersection, wait, cars, breathe exhaust
X: Okay so you don't like… Obviously there's the time factor there, because you're sitting there long enough to take a picture.		
D: Right. So it slows me down, and you just don't feel good sitting at this intersection healthwise. X: Because of the exhaust? D: Right.	It slows me down, don't feel good sitting there b/c of health concerns – exhaust	Slows me down, health concern
X: Okay, are there any other reasons?	Other reasons?	
D: Well safety. I mean you're sitting in turning lanes of traffic and you've got cars in front of you and behind you, so safety is probably another reason why I don't particularly like this place, because you don't feel very in control of your own… You're hoping the other cars will respect your space and respect your safety, but that doesn't always happen.	Safety, don't feel in control, hope cars will respect your space and safety, but doesn't always happen	Safety issue, don't feel in control around the cars
X: Right, you're right. And this particular spot is pretty popular in the area of places that cyclists take to be in the area. So that's perfectly understandable. Okay, well that's great. We've gotten some good stuff so far. So let's talk a little bit about environmental health. Let's start with photos one and two, which are the same place. So tell me a little bit about this place.	Photo 2: EH	EH – organic family farm, local, good way to support people and envt.
D: This is a family-owned farm off of, or it's right on Highway 194 before you get into Valle Crucis. And the pictures don't do	Family owned farm off 194. Can track progression of things growing. Stopped	

it justice. It's at the end of the growing season now, so everything has been picked over. But this summer when I rode this route, probably about once a week, you could kind of track the progression of things starting to come up out of the ground, things starting to bloom. In the harvest season in late summer, I was actually stopped by the family out there when they were doing summer squash picking, and they gave me some because they had too much. So it was really nice, I met them and they told me a little about their farm. They sell at the local farmers market in town on Saturdays. So I guess that there's a personal connection here. So they do all organic farming. They don't use any synthetic petroleum based products on their farm, which is a more environmentally sound way of doing farming, and then they are a local farm. So getting your food locally is a huge environmental health benefit. And as a cyclist you can identify with that, because the further away your food comes the more junk that gets put into the air. And then nobody likes to breathe dirty air. This is what I think of when I think of environmental health. It's like a small-scale farm, minimum impact, minimum transportation to table, if you will. And that's what I think of.	by and family gave me squash b/c they had too much. Nice. Told me about their farm –go to local market, all organic, no petroleum based products, environmentally sound, local food – nobody likes to breathe dirty air from increased transportation, minimum impact	Minimum impact
X: Okay that's great. So, it sounds like in this picture what we see is a small farm, and you can see that there are different rows of different crops, so it's obviously small-scale. But just for your average rider they may not know the things that you know about this place through your personal experience. So it sounds like the personal connection is a big part of this. The fact that you know about the land in general. Is that safe to say?	Personal connection is big part of this?	Personal connection provides the knowledge for me to think its healthy
D: I think so, yes.	Yes	
X: So the environmental health component then is about…	Healthy food and low impact on atmosphere	
D: Healthy food and low impact on the land and the atmosphere as well.		
X: Okay, so that's like transportation costs, price and things like that. Okay, that sounds great. So we have another environmentally healthy photo in here, which is photo five.	Photo 5: EH	
D: Right. Photo five is a picture of a Creek that is on Highway 194 as well, near the farm that we were just talking about them photo one. The stream is clear. It is fast flowing. It's got a healthy bank on either side, and I guess it's easy for me to pick out environmental health because of my education background. So I see… I think of species biodiversity as high in aquatic environments, and water can carry toxins a further distance, and faster than they can travel in the air. So having clean streams is important. I think that when people think of something that's environmentally healthy it just naturally looks healthy. So then it doesn't look like it's doing very well, it'll look decrepit or kind of junky with trash there. And there wasn't any trash in photo five. The water's clear, it's not cloudy. And that's how I labeled it environmentally friendly.	Picture of creek on 194, clear, fast flowing, healthy banks, easy for me to pick out health b/c of educational background. Typically looks healthy if it is. And not if its not.	EH – clean creek –
X: Okay, so your background in environmental biology is playing a big role here.		
D: I think so, yeah.		
X: And you're also saying that typically there's a connection between the appearance of a place and its health.	Connection b/w appearance and health?	
D: Sure, yes.		
X: And that it can be obvious sometimes.	Yes	
D: Right. It can be obvious. If it looks healthy, chances are that it's going to be healthy. Streams are difficult, because water can look healthy but you need instruments to actually measure it.	If it looks healthy, it probably is. Streams are difficult though – need instruments to measure water quality	if it looks healthy, it usually is
X: Okay that's great. You've made some great points here. The last photo to discuss is photo six (and also seven) for your environmentally unhealthy landscape. And this is a golf course. Correct?	Photo 7: EU	
D: Yes. This is the Hound Ears Club golf course on Shulls Mill Road. I saw this as an environmentally unhealthy landscape for a couple of reasons. Golf courses require an incredible	Golf course – requires lots of water, fertilizer and pesticides. Deceiving b/c it looks lush and green, but chemicals	EU – golf course. Deceiving b/c it looks lush

amount of resource input, so water resources and fertilizer and pesticide resources. So they need to keep their grass healthy, and they do that by watering it a lot and putting stuff on it to make it grow. And by keeping rodents and small mammals and bugs out of their property. And it's deceiving, because it looks lush and green, but when you think about what it takes to make it lush and green, you realize that a lot of those chemicals and fertilizers will just run off into mountain streams, like in photo five. And it can be just as devastating to environmental health.	can runoff into streams, can be just as devastating to EH I figured it was EU	
X: Yes, I completely agree with you. I was very excited when I saw that you took pictures of the golf course. I had a feeling it was for your unhealthy environmental photo.		
D: Yes.		
X: And also, in a lot of cases, this grass is clearly not a natural state of vegetation for the area.	Grass not natural vegetation	
D: Oh definitely. Yes, how many mountain fields do you see with lush green grass? Not very many. Right, I would agree with that as well.		
X: Yeah, well this is great. I'm really pleased with the pictures that you've taken. These are great examples.		
D: Sweet. I'm glad they worked out.		
X: So let's talk a little bit about your experience overall. Do you think that taking the pictures helps to you to reflect on the environment that you ride through and your experiences and that sort of thing?	Overall experience: photos helped to reflect?	
D: Oh for sure. You have to stop to take the pictures, which is step one. And usually when I go for a ride about 90% of the time it's because I want to get some fitness out of it. When you're pushing hard and you are just trying to complete your loop or complete your ride, you kind of mistake the forests for the trees. You see it, but you don't really see it. And I think by taking the pictures, and thinking about categorizing the pictures into the four categories, you kind of map out the places that you can recognize as healthy or favorites. And you also can recognize unhealthy or least favorite places. It's a lot easier by using the pictures to categorize them.	Definitely. I usually ride for fitness and miss stuff, you see it, but you don't really see it. Its a lot easier to conceptualize with the photo categories	Photos were very helpful to conceptualize and pay more attention
X: Let's talk about biking in general. So aside from this route, what do you look for in a good bike route in general?	What makes a good bike route?	
D: In a good bike route, you're looking for… I look for primarily, its traffic. I will look for routes that include secondary roads and back roads, primarily instead of main roads or highways, just for the sake of being out of the way of cars. That way I decrease my chances of getting hurt, you know with a vehicle. I also look for difficulty of the route, so depending on what kind of ride I want to get in, I can choose a harder ride or a longer ride, and then if I want to get something quick and fun in, I can do something a little less challenging or shorter, like less mileage. So traffic and distance, I guess the third deciding factor would be if I hadn't been to an area in a while… Like if I hadn't been up on the Parkway for a while. I say, "well I'm going to go ride on the parkway, because I haven't been up there in a while and I need to go back. I need to go see that."	Primarily being away from traffic, using back or secondary roads. Safety issue. And distance – depending on how hard I want to go, or if its just for fun. Also if I hadn't been somewhere in a while – need to go back, need to go see that	Good bike route – away from traffic, distance, going somewhere I haven't been in a while
X: So you say, "you need to go see that." Does that mean that the scenery or the landscape plays a role in this?	Does scenery play a role?	
D: It does. I think that being in a place that you enjoy, while exercising is a bonus. It just makes it that much more enjoyable, when you're happy about where you are and you appreciate where you are, and I'm kicking my own butt on the bike, it's pretty rewarding.	Yes. It's rewarding to be happy where you are while you're exercising. More enjoyable	Scenery important. Good to be happy where you are riding, more enjoyable
X: And would you say that along those same lines that environmental health plays a role in the places that you choose to ride? Like, do you look for healthy environments?	Does EH play a role?	
D: Yes. Yes, so let's see. I'm from a pretty urban area back home in Northern Virginia and it would be tough to find a picture of an environmentally healthy area if I had done the right there. We are fortunate in the high country, because the	Yes, rural envt allows us to escape to countryside to enjoy views, quiet, escape from traffic and hustle and bustle of town	Rural envt is more natural, healthier than urban areas, provides an escape, views, quiet

rural environment allows us to escape, if you will. Boone is like a hub, and then as a cyclist you can escape into the countryside to enjoy views and quiet and escape from just traffic and, you know, the hustle and bustle of town. X: Right. Those are some good ideas. Well, that's most of the questions that I have. Is there anything else? Is there a big picture idea that you take away from this experience? Or anything else you'd like to add? D: Well, I think that I feel that I gained an appreciation for… So, it's an everyday thing for me to ride, and it's an everyday thing for me to encounter all four types of these pictures, but taking the time to say that Hound Ears is overwatering their golf course, how can I make that change? Or how can, you know Grandfather looks really good today, but some days it's hazier and you can't really see grandfather that well from that particular point. So how can I make that change? It really just made me want to become more active in my community, because when you take a picture it lasts forever. And you make a memory out of it, that's when you really connect with the place to a condition or community. And I think that that's important. First and foremost is that, you're riding your bike and you're out in these communities, so why not take action to change them for the better? That's probably the biggest picture or the take-home message. X: Okay, well that sounds great. I'm going to go ahead and stop this.	Anything else? Gained an appreciation. Think about how I can make things better or change, like the overwatering of golf course of haze around Grandfather. Makes me want to become more active in my community. You take the picture, make a memory out of it and really connect with the place or community. Why not make these places better? End.	Place attachment fostered desire for conservation and betterment ← see commentary

The coding process used in this analysis was characterized loosely by the "line by line" coding concept. This involved looking at each statement in the transcript and paraphrasing the major ideas. Then a second line by line coding was performed to paraphrase the first line of coding. In this manner, the major themes and points of the commentary were noted for comparisons with other transcripts. Coding was done in shorthand for the purpose of creating notes for the researcher. Abbreviations were used for common words such as environment (envt), mountain(s) (mtn), because (b/c) and with (w/). Additionally, abbreviations were used when describing photo categories, including favorite environments (F), least favorite environments (LF), environmentally healthy (EH), and environmentally unhealthy (EU). These abbreviations were also used when generally referring to a topic, such as environmental health (EH) in the interview. Certain phrases were highlighted if they were to be quoted in the thesis or demonstrated a major theme to be examined further. In this case, the highlighted material was an example of the importance of appearance when distinguishing environmental quality. Sometimes the commentary in the transcript was worded well enough, that it did not require paraphrasing or was better utilized in its full form, in which case the phrase, "← see commentary" appeared.

Axial coding was performed after the line by line coding process. The lines of code were reread multiple times to look for patterns among the subjects. A list of some of these emerging themes can be seen in the following Appendix, I.

APPENDIX I

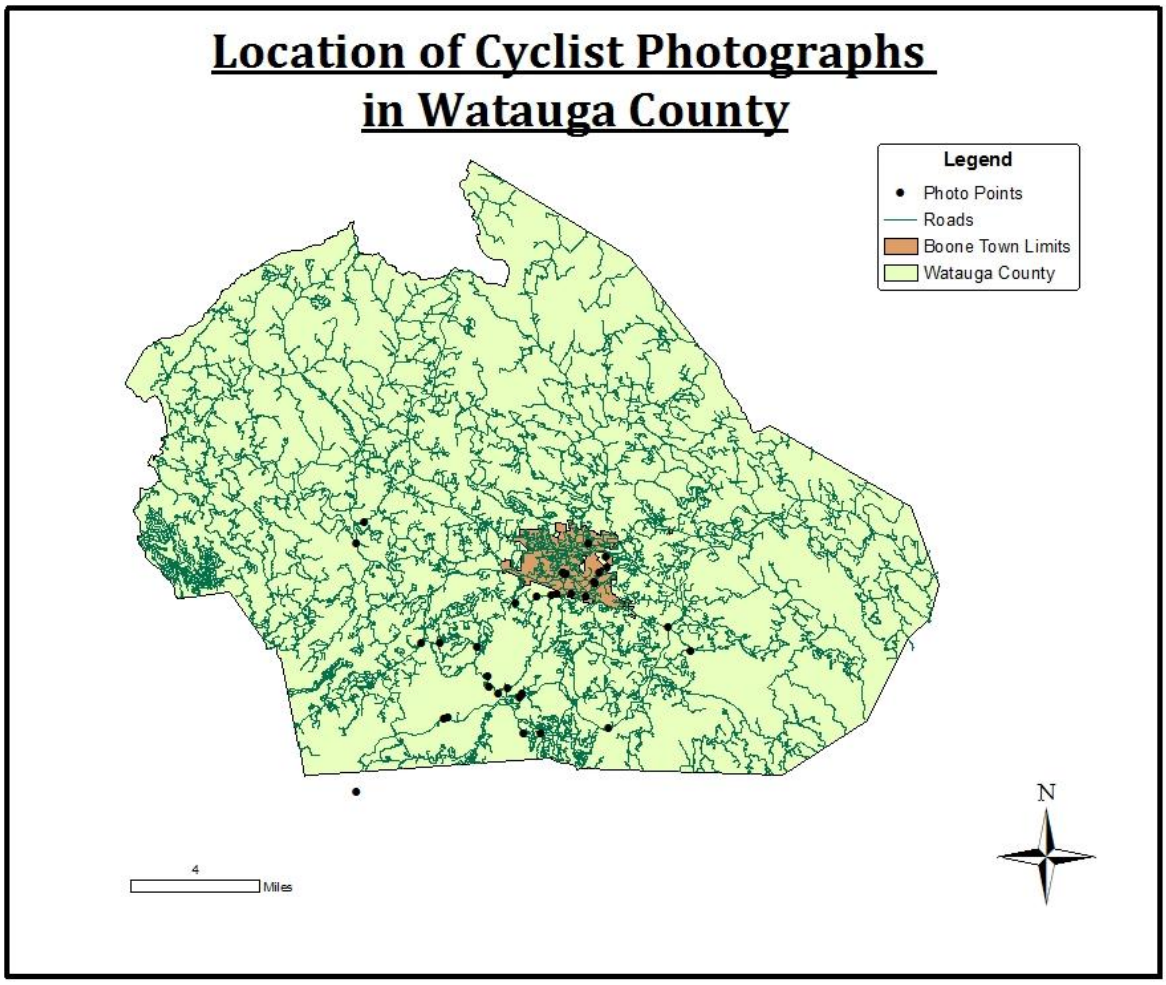
SAMPLE MEMO AND TABLE OF IMPORTANT THEME COUNTS

Sample Memo: "Over half of the subjects stress the importance of appearance when gauging environmental quality. They make statements such as, 'It just looks healthy' (Cyclist E)."

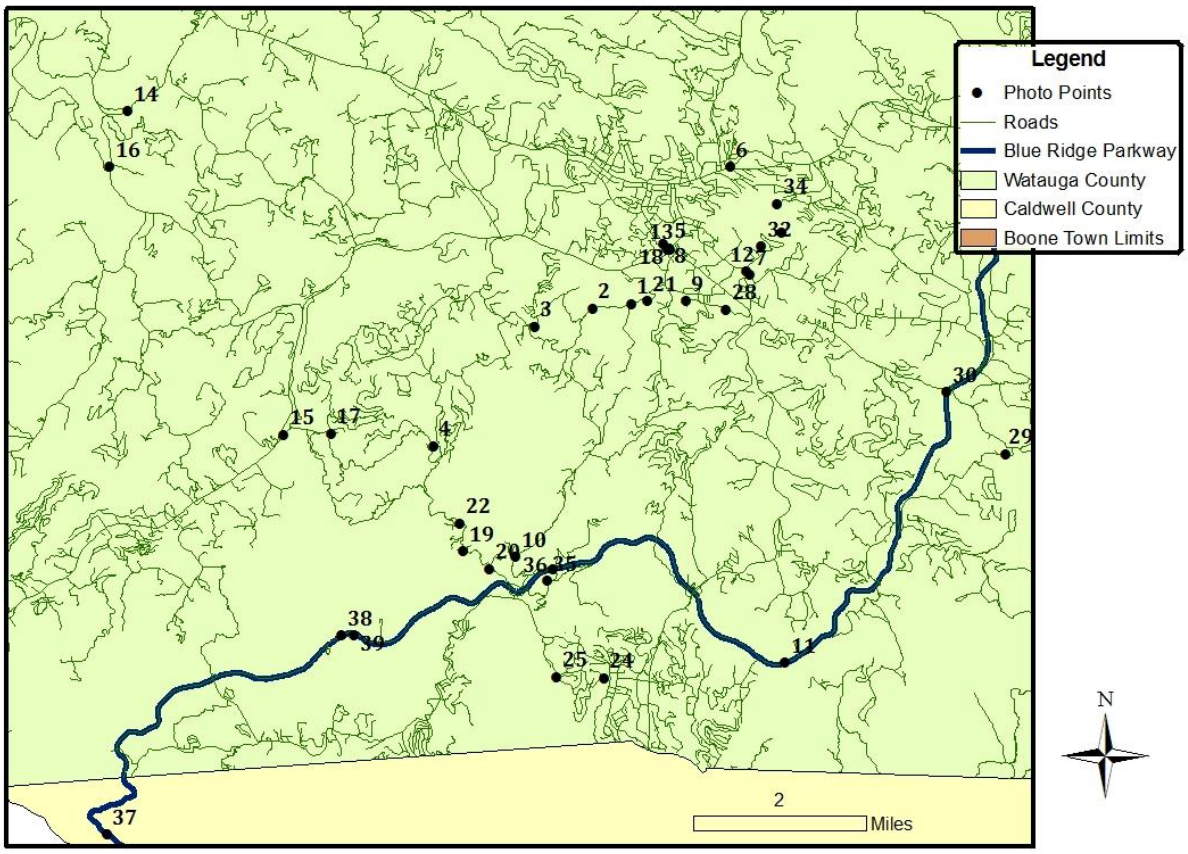
Count for Important Themes		
Theme	**Number of Subjects to Mention Theme**	**List of Subjects**
Appearance used to gauge environmental quality	5	A, C, D, E, G
Noted similarities between favorite and healthy environments	4	A, C, G, I
Mentioned cars as unhealthy for the environment	5	A, D, F, H, I
Favored the scenic aesthetic	7	A, C, D, E, F, G, I
Noted aspects of sense of place	5	A, B, D, G, I

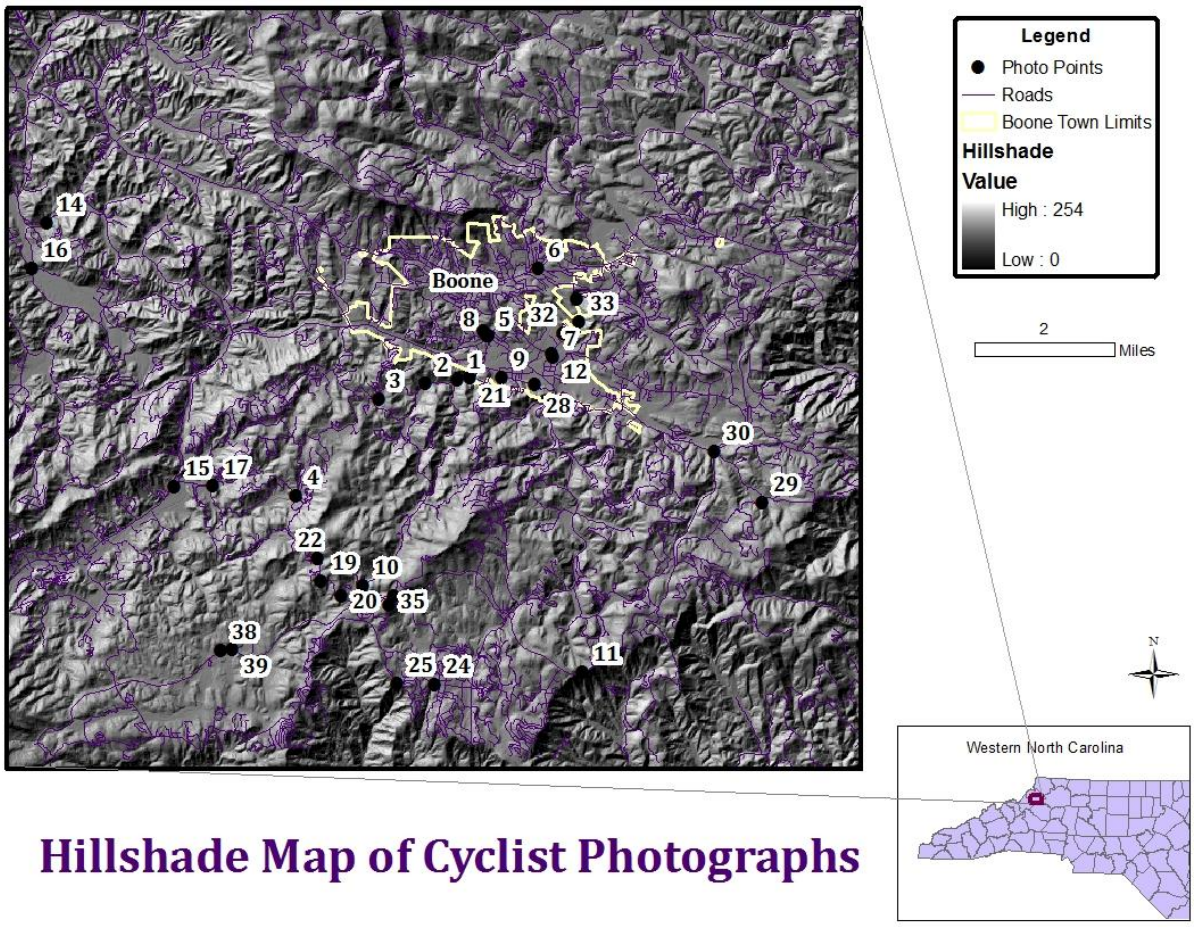
APPENDIX J

GIS Maps



Location of Cyclist Photographs, Close-Up





Hillshade Map of Cyclist Photographs

APPENDIX K

Table of Participant Demographics

Cyclist ID	Age	Gender	Student Status	Major	Hometown	Years Cycling Experience	Years Cycling in Boone
A	27	Male	Graduate	Political Science	Marietta, GA	14	1
B	23	Male	Graduate	Exercise Science	Charlotte, NC	6	<1
C	19	Male	Undergraduate	Biology	Kernersville, NC	4	<1
D	21	Male	Undergraduate	Environmental Biology	Arlington, VA	3	2
E	19	Male	Undergraduate	Political Science	Rutherfordton, NC	6	1
F	18	Male	Undergraduate	Geology	Shelby, NC	3	<1
G	19	Female	Undergraduate	Exercise Science	Boone, NC	6	6
H	19	Male	Undergraduate	Secondary Education: Math	Apex, NC	2	<1
I	18	Male	Undergraduate	Recreation Management	Atlanta, GA	8	<1

VITA

Amanda Whitley Roberts was born in Atlanta, Georgia, on May 25, 1985. She attended school in Gwinnett County and graduated from Brookwood High School in May 2003. The following autumn, she began classes at the University of Georgia. In May of 2009, she received a Bachelor of Arts degree in Latin American and Caribbean Studies with minors in Geology and Spanish. She later attended Appalachian State University, where she accepted a research assistantship and was awarded a Master of Arts degree in Geography in August 2011. Amanda will commence studies in a Ph.D. program for Geography at the University of Nevada, Reno in the fall of 2011.