

Are Rock Climbers Crunchy? : Serious Leisure, Place Attachment and Environmental
Concern in the Shawangunks

A thesis presented to
the faculty of
The Patton College of Education
of Ohio University

In partial fulfillment
of the requirements for the degree
Master of Science

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May 2013

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This thesis titled
Are Rock Climbers Crunchy? : Serious Leisure, Place Attachment and Environmental
Concern in the Shawangunks

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Abstract

WILSON, WILLIAM RICHARD, M.S., May 2013, Recreation Studies

Are Rock Climbers Crunchy? : Serious Leisure, Place Attachment and Environmental Concern in the Shawangunks

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The links between outdoor recreation participation and environmentalism are hazy at best. This study provides clarity for this relationship by examining the effect that level of leisure participation, mediated by place attachment, had on an individual's level of environmental concern. A questionnaire comprised of three individual measures of serious leisure, place attachment and environmental concern was distributed to rock climbers in the Shawangunk Mountains of New York State ($N = 151$). A mediation analysis, as outlined by Kenny, Kashy and Bolger (1998) was used to quantitatively explore this relationship. While evidence could not be garnered of a mediation effect, a direct, although weak, effect was discovered between serious leisure participation and environmental concern. Exploratory analyses later revealed a strong direct relationship between serious leisure participation and place attachment.

Table of Contents

	Page
Abstract	2
List of Tables	6
List of Figures	7
Chapter 1: Introduction	8
Chapter 2: Literature Review	14
Environmental Concern	14
Place Attachment	23
Serious Liesure.....	27
Research Hypotheses.	31
Chapter 3: Methods	32
Setting	32
Participants.....	33
Procedures for Data Collection.....	34
Research Design	35
Measurement.....	36
Serious Leisure Inventory and Measure (SLIM).	36
Place Attachment	37
New Ecological Paradigm (NEP) Scale.....	38
Procedures for Data Analysis	38
Testing for Mediation	39
Chapter 4: Results	42
Descriptive Statistics.....	42
Bivariate Correlation Analysis.....	43
Hypothesis Testing	43
Testing for Mediation	43
Exploratory Analysis	46
Expounding Upon the SLIM.....	48
Chapter 5: Discussion	51

	5
Interpretation of Results.....	51
Study Limitations.....	55
Implications of Exploratory Findings	57
Directions for Future Research	58
Conclusion	59
References	61
Appendix A: Participant Consent Form.....	70
Appendix B: Questionnaire.....	72
Appendix C: Individual Measures and Comprising Factors	75
Appendix D: IRB Approval Letter	77

List of Tables

	Page
Table 1: Descriptive Statistics: SLIM, Place Attachment and NEP.....	43
Table 2: Testing the Mediation model: Multiple Regression Analyses.....	45
Table 3: Regression of Level of Participation on Place Attachment Factors	46
Table 4: Place Dependence and Identity across SLIM Quartiles	47
Table 5: Pairwise Comparison: Place Attachment across SLIM Quartiles.....	48
Table 6: Mean Climbing Days and Self-Reported Climbing Ability.....	49
Table 7: Pairwise Comparison: Mean Climbing Days and Self-Reported Climbing Ability.....	49

List of Figures

	Page
Figure 1: Diagram of Path C in Mediation Model.....	39
Figure 2: Theoretical Mediation Model of Place Attachment on Serious Leisure and Environmental Concern	40

Chapter 1: Introduction

Environmental systems consultant and educator Andres Edwards (2005) believes that human-nature interaction is the core of sustainability. Upon deeper examination of this relationship, it appears that a high level of environmental concern may serve as a basis for determining actions that promote sustainability (Bamber & Moser, 2007; Fransson & Garling, 2001). Edwards (2005) contends that new worldviews and perspectives on the relationship between humankind and the natural world must develop in order to ensure the survival of humankind and the planet. Humans possess the unique ability to make potentially catastrophic alterations to the natural environment (Gore, 2006; Samson, Berteaux, McGill & Humphries, 2011; Thogerson, 2009). Given these considerations, today's societies should consider how to live life in a way that causes the least possible impact on the environment (Takacs-Santa, 2007).

Although definitions have often varied, environmental concern for the purpose of this study is defined as an attitude that places humankind as equal, and not superior, to the rest of the natural world. According to Dumanoski (2009), humankind is in need of a new cultural map focused on environmental concern with which to navigate the tumultuous 21st century. Many have warned that if this cultural shift motivated by environmental concern does not occur, humankind will continue to face a dangerous future defined by climate change, biodiversity loss, toxin and pollutant exposure, deforestation, increased natural disasters and general uncertainty regarding the future of the global environment (Carson, 1962; Colburn, 1996; Dumanoski, 2009; Gore, 2006; Pellow, 2007; Samson, et al., 2011; Walker and Salt, 2006).

One factor that could influence a person's level of environmental concern is the degree to which a person feels or develops a sense of attachment to a specific natural setting. Research has shown that place attachment promotes environmentally responsible behaviors which imply an environmental concern for the specific setting to which an individual is both dependent upon and identifies with (Vaske & Kobrin, 2001). This concern should then transfer to and influence his /her general lifestyle behaviors as well (Vaske & Kobrin, 2001). Place attachment has also been shown to explain variance in environmental concern above all other socio-demographic variables (Vorkinn & Riese, 2001). Researchers concerned with the creation and fostering of environmental concern have devoted a great deal of attention to place attachment (Lee, 2011; Moore & Graefe, 1994; Schuster, et al., 2011; Vaske & Kobrin, 2001; Vorkinn & Riese, 2001).

When examining place attachment through the lens of environmental psychology, one tends to describe the meanings of place as dictated by two factors: place dependence and place identity (Vaske & Kobrin, 2001; Williams & Vaske, 2003). Place dependence is considered a functional attachment to a resource that enables the participation in or completion of a specific, desired end (Bricker & Kersletter, 2000; Stokols & Schumaker, 1981; Vaske & Kobrin, 2001). This sort of dependant relationship might exist between a rock climber and a local crag or a white-water enthusiast and a local rapid. Place dependence is predicted to increase over time as frequency of use on the behalf of an individual increases (Kyle, Bricker, Graefe, & Wickham, 2004). Place identity addresses an emotional rather than a functional attachment that tends to develop with increased frequency of use and as a resulting function of place dependence (Brikcner & Kersletter,

2000; Moore & Graefe, 1994; Vaske & Kobrin, 2001; Williams & Vaske, 2003). Place identity and activity participation are positively correlated, due to the fact that identity continues to grow with repeated participation (Williams and Vaske, 2003). Through this participation, users experience the formation of memories and the growth of relationships with companions, thus contributing to place identity (Schuster, Sullivan, Kuehn & Morais, 2011).

Recreation participation that reflects a greater level of seriousness could affect the level of attachment a person experiences. Serious leisure, as contrasted to casual leisure, is defined as “the systematic pursuit of an amateur, hobbyist or volunteer activity sufficiently substantial and interesting in nature for the participant to find a career thereby acquiring and expressing a combination of its special skills, knowledge and experience” (Stebbins, 1992, p, 3). A casual leisure experience is defined as an “immediately, intrinsically rewarding, relatively short-lived pleasurable activity, requiring little or no special training to enjoy” (Stebbins, 1997, p.18).

The relationship between place attachment and serious leisure has not been the focus of much research to date. However, the relationship between place attachment and recreation specialization has been explored (Bricker & Kerstetter, 2000; Oh, Lyu & Hammit, 2012) and when considered in the context of research regarding serious leisure and recreation specialization, interesting linkages can be found. In their discussion of recreation specialization Tsaor and Liang (2008) described how various factors of recreation specialization, including “significant personal efforts, identifying strongly with the activity, and having careers in their endeavors were strong indicators of participation

in serious leisure” (p. 337). Bricker and Kerstetter (2000) drew similar conclusions, stating that factors of recreation specialization were significantly related to at least one factor of place attachment. Cheng and Tsaor (2012) provided that level of recreation specialization increased as a result of serious leisure participation. Therefore, one might extrapolate that participation in serious leisure promotes recreation specialization (Tsaor & Liang, 2008) and subsequently, that recreation specialization results in increased levels of place attachment (Oh, Lyu & Hammit, 2012).

Those who engage in Nature Challenge Activities, a term coined by Davidson and Stebbins (2011), are participating in serious leisure outdoor recreation activities that specifically engages the natural environment. They highlight the fact that serious leisure participants in Nature Challenge Activities “often make fine champions of sustainability (Davidson and Stebbins, 2011, pp.198). Drawing from that logic and their observations, they conclude that nature is pure and simply, “awe-inspiring”, especially for those who are participating in a Nature Challenge Activity (Davidson and Stebbins, 2011, pp.198). They also draw upon the observed desire of Nature Challenge Activity participants to maintain the landscapes in which they recreate as untrammelled so as not to dilute the quality of their own leisure pursuits (Davidson and Stebbins, 2011).

Although evidence (Lee, 2011; Raymond, Brown & Robinson, 2011) has indicated that a person’s attachment to a setting can lead to environmental concern, there could be other factors involved as well. Such as, awareness to environmental problems, feelings of guilt regarding the state of the natural world, or the pressures from modern, pro-environmental social norms have also been cited as influencing the attitude of

environmental concern (Bamberg & Moser, 2007). For example, an individual brought up in a community or school that places a high priority on environmentally responsible attitudes and behaviors may experience environmental concern differently.

A multitude of research has examined the links between outdoor recreation participation and the development of environmental concern; however, there is a lack of cohesion in the conclusions drawn and the potential variance in benefit based upon specific types of participation (Berns & Simpson, 2009; Nord, Luloff, & Bridger, 1998; Tarrant & Green, 1999; Teisl & O'Brien, 2003; Thapa & Graefe, 2003; Theodori, Luloff, & Willits, 1998). According to Berns and Simpson (2009), there is a very apparent gap in the current literature in regards to the relationship that exists between outdoor recreation participation and environmental concern development. After conducting a review of thirty years of research on this relationship, they concluded that, "whether a person recreates in the outdoors does not alone predict his or her environmental attitudes, nor does a person's environmental thinking alone determine whether s/he recreates outdoors" (Berns & Simpson, 2009, p. 88).

To be prepared for the dreary predictions that many are making regarding the 21st century, a new worldview must emerge that does not allow for the continuation of business as usual, but instead offers a perspective that is ecologically or ecocentrically, rather than anthropocentrically, motivated and driven by environmental concern rather than complacency (Dumanoski, 2009; Edwards, 2005; Edwards, 2010, Walker & Salt, 2006). Therefore, the purpose of this study is to examine the effect that level of serious

leisure participation, mediated by place attachment, has on an individual's environmental concern.

Chapter 2: Literature Review

This literature review provides a theoretical foundation upon which the research regarding environmental concern, place attachment and serious leisure participation was conducted. This research assessed the mediation effect of place attachment on serious leisure participation and environmental concern as measured by the New Ecological Paradigm scale. First, the literature regarding the New Environmental Paradigm and the accompanying New Ecological Paradigm scale is addressed. This review then discusses place attachment, with a focus on previous literature regarding place dependence and place identity and their relationships to the development of environmental concern. Finally, a discussion of serious leisure and the recently developed Serious Leisure Inventory and Measure (SLIM) provide the framework upon which the predictor variable operationalized and subsequently explored.

Environmental Concern

In the not too distant past, human facilitated environmental degradation was typically realized in the form of industrial and resource extraction practices; however, in more recent history, an increasingly significant share of environmental impacts stems directly from individual consumption habits (Thøgersen, 2009). With consumption, there is waste. In 2007, the United States accounted for 5% of the world population, but accounted for 19% of total planetary waste generated and the average United States citizen created 31.5 pounds of waste on a weekly basis, thereby leading the world in waste generation (Pellow, 2007). This certainly is neither environmentally sound, nor sustainable and therefore reinforces the need for the aforementioned cultural shift from

humankind's stance of superiority to equal member of the natural world (Catton & Dunlap; 1980; Dumanoski, 2009; Leopold, 1970; Pellow, 2007).

To more fully explore what this cultural shift might model and what is meant by environmental concern, one might look to Leopold's "land ethic" (1970). Leopold (1970) described the potential outcome of adherence to the land ethic as a shift in the role of humans from a position focused on domination of the natural world to a position of equality defined by equal membership in the broader biotic community. It is important to note that Leopold was not calling for the return of the human species to a pastoral state or the cessation of all natural resource extraction and consumption. Instead, he simply sought to remind that everything, both human and non-human, has a "right to a continued existence" (Leopold, 1970, pp.240).

It is important to define more fully the concepts of ecocentrism and anthropocentrism before continuing with this review. While often viewed from the standpoint of philosophy they are terms that are becoming more and more the focus of contemporary environmental thought. Anthropocentrism highlights human beings, their needs and their desires as serving as the primary actor in the natural world and possessing an inherent superiority to other parts of the rest of the natural world (Donahue, 2010). At the other end of the philosophical spectrum, and similar in perspective to Leopold's (1970) land ethic, lies the concept of ecocentrism or biocentrism. Since the 1970's, ecocentrism has been adopted as one of three characteristics that define Naess' (1973) philosophical concept of deep-ecology. Germane to this discussion, these inter-related concepts could be defined as an understanding that the non-human world has inherent

value, equal to that of humans. This ecocentric perspective postulates that humans should be able to interact with the non-human world in a much deeper and less abusive manner than is generally accepted by an anthropocentric world-view (Naess, 1973; Warwick, 1993).

This philosophical spectrum parallels the sociological spectrum posed by Catton and Dunlap (1980), in which they identify the Dominant Social Paradigm of human exceptionalism as an anthropocentric benchmark and the New Environmental Paradigm as an opposing ecocentric perspective. Dunlap and Van Liere (1978) developed the New Environmental Paradigm based upon three facets of the human-nature relationship: the influence the human species can have on the balance of nature, the potential acceptance to limits of growth regarding human development and the role of humankind as the dominant and superior species on the planet.

When considering the relationship between human beings and the natural world, one could simply reference the explanations provided above regarding an ecocentric worldview, in which humans are not a separate entity from the remainder of the natural world (Naess 1973; Warwick 1993) or an anthropocentric world view, in which a human being holds themselves separate and superior from the natural world (Donahue, 2010). In an effort to define this relationship in more quantifiable measures, researchers from numerous fields have created scales and paradigms to assess this connection.

Dunlap and Van Liere (1978) coined the New Environmental Paradigm (NEP), and created a corresponding 12-item scale to measure this paradigm, as a response to a Dominant Social Paradigm (DSP), which in the late 1970s was inherently anti-

environmental and continues to be so today (Dunlap, 2008). In contrast to this anthropocentric paradigm, and in reaction to issues that were already becoming apparent in the 1970s such as limits to growth and a balance of nature, the NEP was created in an effort to highlight a more eco-friendly stance on the human-nature relationship. Even in the late seventies, Dunlap and Van Liere found a high level acceptance to the NEP when surveying two groups of Washington State residents. In their initial study, they surveyed a general population of residents (GPS) using random sampling techniques. In addition to this GPS, they also surveyed members of a statewide environmental organization (EOS). By examining the relationship between the results of these two sample populations, they were able to assess the validity of their scalar measure of the NEP. Their findings held two major implications: (1) there was a fairly highly acceptance of the NEP even in the GPS population and (2) as one might expect, the acceptance of the NEP was higher amongst the EOS than the GPS (Dunlap & Van Liere, 2008).

Arguably, the NEP scale planted the seed for assessing the values held by citizens in relationship to the natural world; however, since that time a great deal has changed. The original authors revisited their original study in 2000 and made two distinct changes to their original scale. In order to enhance the effectiveness and maintain the tangibility and applicability of the scale, the authors attempted to accommodate for the emergence of a more globalized society (Dunlap, Van Liere, Mertig, & Jones, 2000). Dunlap et al. also attempted further modernization by removing sexist (mankind v. humankind) terminology from scale items (2000). Subsequently, the New Environmental Paradigm and its accompanying New Ecological Paradigm Scale have been and continue to be used

widely to assess environmental attitudes across disciplines and regions (Harraway, J., Broughton-Ansin, F., Deaker, L., Jowett, T., & Shephard, K., 2012; Kopnina, 2011; Wu, 2012).

However, these efforts proved insufficient to some. In a 2007 study, Lundmark determined that the NEP scale was no longer an appropriate measure. Lundmark argued that the NEP had become antiquated, citing that the environmental ethics of the 21st century are drastically different from those of the 1970s (Lundmark, 2007). With this questioning of the appropriateness and effectiveness of the NEP, researchers have looked to other scales and measures to assess the human-nature connection (Davis, Le, & Coy, 2011; Mayer & Frantz, 2004; Nisbet, Zelenski, & Murphy, 2009; Perrin & Benassi, 2009).

One such example is the Connectedness to Nature Scale (CNS), created in 2004 by Mayer and Frantz. In the development of their scale they question the effectiveness of the NEP, and attempt to differentiate their scale from it in two primary ways. First, they proposed that the NEP stops at the cognitive level of evaluating the human-nature interaction and fails to address an emotional level. Secondly, they believe that many of the items in the NEP measure human cognition of the human-nature relationship from the standpoint of a species, not as an individual. (Mayer & Frantz, 2004) Mayer and Frantz's scale underwent a five-study assessment, at the end of which, the authors were confident that the CNS, in addition to being reliable and valid, was related to environmentally responsible behavior (2004).

Nothing comes without criticism however, and in 2009, the ability of the CNS to draw conclusions regarding the emotional aspect of the human-nature relationship was questioned by Perrin and Benassi. They questioned the usage of the word “feel” in eight of the fourteen items that appear in the CNS, as an effective way of measuring emotion. Perrin and Benassi propose that feel, which is synonymous with “think” and “believe”, does not actually assess an emotional aspect of the human-nature relationship (2009). Just as Mayer and Frantz questioned the effectiveness of the NEP in assessing anything more than cognition (2004), Perrin and Benassi question the effectiveness of the CNS in accomplishing what it was created to do (2009). While they acknowledge that the CNS does address a dimension of connectedness to nature, they recommend the cessation of further discussion and usage of the CNS as a measure of the emotional aspect of the human-nature relationship, thus rendering the efforts of Mayer and Frantz, for all intents and purposes, fruitless (Perrin & Benassi, 2009).

Nature relatedness, which can be likened to deep ecology, in their common assumptions of man as a part of nature, not separate from it, has also been explored (Nisbet et al., 2009). In an effort to differentiate from the NEP, which attempts to evaluate the cognitive aspect of how people should interact with the natural world (Dunlop et al. 2000; Dunlap & Van Liere, 2008; Lundmark, 2007) and from the CNS (Mayer & Frantz, 2004), which, according to its authors, attempts to integrate the emotional aspect of human-nature interaction in addition to the cognitive level of interaction; the nature relatedness scale addresses not only the cognitive and emotional levels of this interaction, but also addresses the physical interactions between humans and

nature (Nisbet, et al., 2009). However, even though this measure was validated as measuring the affective, cognitive, and experiential aspects of an individual's interaction with the natural world, the authors were unable to address the gap that exists between concern for, or a connection with, nature and an actual realization of environmentally responsible behaviors in general lifestyle decisions (Nisbet, et al., 2009).

In an effort to address the multitude of measures and scales that have been created across disciplines, Davis, Le and Coy conducted a study in which they administered five previously documented measures, in addition to a measure of their own creation which they termed, Willingness to Sacrifice (WTS) (2011). WTS aimed to assess an individual's likelihood that he or she would be willing to make a sacrifice to their own desires in order to prevent harm to the natural environment (Davis, Le, & Coy, 2011). The goal of their study was to build a model off of which practitioners and researchers could effectively assess a commitment to the environment and from this ascertain predictors of environmentally responsible behaviors. In their conclusions, Davis, Le and Coy were able to verify their hypothesis and validate their WTS measure; however, they were still left with hesitations regarding what is actually required, beyond a theoretical level in order to facilitate the development of environmentally responsible behaviors in citizens (2011).

Does the proliferation of slightly varied measures and scales indicate a lack of success in these measures and scales of actually informing researchers on the human-nature relationship? A researcher might look to conduct a long-term study in which they could assess a participant's pre-test and post-test scores on these measures over a

duration of time during which the researcher could attempt to manipulate variables in participants lifestyle behaviors. This would help researchers and policy makers to potentially possess a better understanding of the relationships that exists between the constructs tested in these scales and measures and environmentally responsible behavior. However for the purposes of this study, and the desire of the primary investigator to address environmental concern, the New Ecological Paradigm scale will be engaged. As American Culture continues to receive a healthy dose of green-washing media, consumer markets and popular culture are embracing the fads of environmentalism through promotion of environmentally responsible behaviors and the marketing of environmentally friendly products (Krieg, 2008). However, American culture has progressed beyond simple and small-scale environmentally responsible behaviors and a philosophical shift is occurring towards the adoption of a new worldview (Brasier, 1995). While Brasier may have been a bit ahead of the curve in citing a cultural shift surrounding environmental attitudes, behaviors and concerns; recent literature makes a strong argument for the yet to be satiated need for a cultural shift towards an ecological or ecocentric worldview, which is defined by environmental concern (Bernard, 2010; Dumanoski, 2009; Edwards, 2005; Edwards, 2010; Xiao & Dunlap, 2006). Xiao and Dunlap (2006) offer the following opinion regarding environmental concern:

...an ecological worldview, operationalized by the New Environmental Paradigm Scale, serves as the organizing anchor within the environmental belief system...we hypothesize that the NEP serves as the central component of environmental concern and thus provides the source of coherence of environmental concern (p. 1).

Therefore, this review has served to explore the variable of environmental concern as contextualized by the New Environmental Paradigm and adherence to said paradigm through the New Ecological Paradigm Scale.

While some of the literature reviewed here might be considered dated (Catton & Dunlap, 1980; Leopold, 1970; Naess, 1973), it is important to note that many researchers continue to use the New Ecological Paradigm scale as a psychometric approach to addressing environmental concern (Burn, Winter, Hori & Silver, 2012; Islam, 2012; Thapa, 2010). Environmental Concern is arguably more important of a discussion than ever before in light of the acceptance of the international scientific community that global warming is occurring at the hand of human activities and will present difficulties for world weather patterns, including an increase in catastrophic weather events, increases in infectious diseases and widespread flooding (Intergovernmental Panel on Climate Change, 2007; World Resources Institute, 2009) and the current, necessary focus on sustainability (Bernard, 2010; Burn, et al., 2012; Dumanoski, 2009; Edwards, 2005; Edwards, 2010; Gore, 2006; Sahin, Ertepinar, Teksoz, 2012; Walker and Salt, 2006). While this discussion of environmental concern in the context of the New Environmental Paradigm, the New Ecological Paradigm Scale and other psychometric approaches to assessing the human/nature interaction is important, this discussion must also be grounded in tangible, practical lines of thinking emerging from this research. With the acceptance of the fact that humankind is having dangerous impacts on the natural world and the modern conception of environmental concern can be summarized as pertaining to the concept of sustainability. As discussed throughout this review in order to preserve the

planet and the conditions that make it habitable for humankind, a cultural shift must occur (Dumanoski, 2009; Edwards, 2005; Edwards, 2010, Walker & Salt, 2006). As this study and others recommend, “environmental sustainability may require embracing a new ecological paradigm” (Burn, et al., 2012, p. 142). Therefore, it is with the contemporary understanding that an integral component of sustainability is an alteration of the attitudes that humankind holds towards the natural world that this study seeks to better understand environmental concern and ways in which it might be fostered.

Place Attachment

The meanings ascribed to place by those who visit them have been examined from various academic disciplines and seen numerous applications to agriculture, education and land management, to name a few (Gosling & Williams, 2010; Lee, 2011; Vaske & Kobrin, 2001; Williams & Vaske, 2003; Wynveen, Kyle, Absher, & Theodori, 2011). Most significant to this review are the interpretations as held in the discipline of environmental psychology. When examining place attachment through the lens of environmental psychology, one tends to describe the meanings of place as being dictated by two factors: place dependence and place identity (Kyle, Graefe, & Manning, 2005; Vaske & Kobrin, 2001; Williams, Patterson, Roggenbuck & Watson, 1992; Williams & Vaske, 2003).

Place dependence is considered a functional attachment to a resource. The place allows participation in or completion of a specific, desired pursuit (Jorgenson & Stedman, 2001; Stokols & Schumaker, 1981; Vaske and Kobrin, 2001). This aspect of the human place relation has been observed to grow as frequency of use increases (Vake and Kobrin,

2001). Vaske and Kobrin provide the example of a kayaker visiting a small river with low to moderately challenging rapids, with a fairly high frequency of visits, as a site to practice skills to later be applied to a more advanced setting in an effort to illustrate this functional attachment and ongoing relationship that a resource and participant may engage in (2001).

Place identity addresses an emotional rather than a functional attachment that tends to be developed over time (Vaske and Kobrin, 2001). Place identity tends to grow as a function of both place dependence and frequency of usage over a period of time (Moore & Graefe, 1994). Place identity can be examined as a factor that contributes to self-identity and has a direct effect on the feelings of inclusion that one has to a larger community. The high level of emotional investment has also been highlighted by Kyle, Mowen and Tarrant (2004) who noted that place identity is not necessarily a function of a place itself, but the meanings an individual ascribes to that place. Previous research has shown that place identity influences a visitor's environmentally responsible behavior at a specific site (Vaske & Kobrin, 2001). However, operating under the assumption that place identity contributes to a feeling of belonging to a greater community, Vaske and Kobrin postulate that these site-specific environmentally responsible behaviors should logically carry over to similar behaviors in one's general life. If a visitor carries out their garbage and respects wildlife while at a specific site, they should then also be concerned with behaviors such as recycling, carpooling or water conservation in their typical lifestyle behavior choices (2001). Vaske and Kobrin's (2001) research supported a model that illustrates a positive correlative relationship between frequency of use and

place dependence, which then transfers into an increase in place identity, subsequently encouraging environmental concern in everyday life.

A 2011 study, which employed the same operational definition of place attachment as being comprised of place dependence and place identity, added the constructs of conservation commitment and recreation participation to provide further specification to a user's progression from place attachment to environmental concern as outlined in the aforementioned Vaske and Kobrin study. Lee defined conservation commitment as a willingness to put forth effort and behaviors that promote environmental conservation, thus exhibiting environmental concern (2011). Recreation involvement was defined as, "the degree to which an individual engages in a particular activity" (Lee, 2011, p.899). After conducting a study of recreation visitors to a wetland site in Japan, this study was able to provide evidence that both place attachment and recreation involvement have a significant and direct impact upon conservation commitment and general environmental concern (Lee, 2011).

In a study further exploring the construct of place attachment in the context of recreation specialization, Oh, Lyu and Hammit (2012), discussed how as recreation specialization increases, general motivation for participating in that activity and the dependency on a resource for participation opportunities increase in a direct relationship. Recreation specialization was defined by Bryan (1977) as "a continuum of behavior from general to the particular, reflected by equipment and skills used in the sport and activity setting preference" (p.175). Recreation specialization is typically studied through a three-dimensional approach; behavioral, cognitive and affective (Oh, Lyu & Hammit,

2012). The behavioral dimension is comprised of previous experiences and the collection of and investment in necessary equipment. The growth of a defined skill set and the acquisition of knowledge typically define the cognitive dimension and the role of the recreation activity in shaping an individual's lifestyle or image and the presence of enduring involvement typically define the affective dimension. (Oh, Lyu & Hammit, 2012) Oh, Lyu and Hammit concluded that the cognitive dimension of recreation specialization exists in a direct relationship to place identity development (2012). According to the 2012 study, the recreationist that is a highly skilled and knowledgeable will experience a sense of satisfaction with their experience in a specific recreation destination is likely to "acquire a strong bond with a specific place, primarily in regards to place identity" (Oh, Lyu & Hammit, p.84). Similarly, in an earlier study, Bricker and Kerstetter (2000) concluded that place identity increases as level of recreation specialization increases amongst whitewater paddling participants.

It is this link between place attachment, specifically identity, and recreation specialization that informs the connection between place attachment and serious leisure. Both recreation specialization and serious leisure have been used to explore intense types of leisure pursuit participations. It is important to consider that since the time of their inceptions, both serious leisure and recreation specialization have served as frameworks to explore the phenomena associated with those who participate in an activity along a continuum ranging from casual to serious (Stebbins, 1982) or casual to committed (Bryan, 1979). However, we must now consider that, as Stebbins (2005, 2007) recommends, there is some advantage to considering recreation specialization simply as

one facet of the construct of serious leisure. Scott (2012) recommends a marrying of these two constructs in moving ahead with research focusing on the nature of intense leisure participation. It is under this operational shift that this study operates and therefore finds foundational support for extrapolating the relationships documented in the literature from recreation specialization and place attachment to serious leisure and place attachment.

Serious Leisure

Participation in outdoor recreation as a leisure pursuit can be defined on a continuum ranging from casual leisure to serious leisure (Shen & Yarnal, 2010; Stebbins, 1982; Stebbins, 1992; Stebbins, 1997). Serious leisure has been examined in a variety of leisure pursuits; including, quilting (Stalp & Conti, 2011), belly dancing (Kraus, 2010), sadomasochism (Newmahr, 2010), sport tourism, (Green & Jones, 2005), chess (Gould, et al., 2011), hiking (Littlefield & Siudzinski, 2012) and other outdoor recreation pursuits (Davidson & Stebbins, 2011).

In order for an activity to be defined as serious leisure it must meet the following six criteria (Stebbins, 1992). (1) Activities must involve perseverance, which may involve overcoming embarrassment, danger or unsuccessful streaks. This facet of serious leisure was explored in depth amongst serious leisure participants in running that reported even with risk of injury or disappointment or lack of general safety, the benefits of running still outweighed costs and therefore participants continued to participate (Major, 2001). (2) Involvement in this activity creates a career, which may involve awards, certifications and/or achievements. Heuser (2005) documented the development of a

leisure career amongst female lawn bowlers, tracing it from introduction to playing, to organizational involvement to retirement from. (3) In order to participate in the activity one must put forth a high level of personal effort based upon “specially acquired skills or knowledge” (Green & Jones, 2005, p.168). This skill and knowledge attainment was documented amongst serious leisure volunteers at sporting events at the Francophone Games in Ottawa, CA (Gravelle & Larocque, 2005). (4) Participation may result in “the enhancement of the self-concept, self-actualization, self-enrichment, self-expression, feelings of accomplishment...and social interaction” (Green & Jones, 2005, p.168). These might also be considered the durable outcomes of serious leisure participation (Stebbins, 1992). This aspect of serious leisure was highlighted in Dilley and Scraton’s (2010) study focused on women and the serious leisure pursuit of rock climbing. Emphasizing that “constructing climbing bodies, developing climbing relationships and negotiating the (potential) constraints of motherhood were all central defining aspects” of study participants leisure pursuit of climbing (Dilley & Scraton, 2010, p.138). (5) Participation in the activity creates a social world with organized groups, hierarchies and social structures based on a unique ethos. This subcultural phenomena was well documented in Green and Jones’ (2005) study regarding sport tourism and serious leisure in which they observe that “travel may help serious leisure participants to escape from enduring identities, such as work role identities, and seek out identification with a serious leisure subculture” (p.177). (6) There is a significant level of individual social identification that results from participation (Stebbins, 1992). This is even better understood in direct comparison to the potential for social identification at the hand of

casual leisure. In contrast to serious leisure, Stebbins (2007) described casual leisure as such: “though hardly humiliating or despicable, is too superficial and transient to generate special identity” (p.12).

In more recent research regarding serious leisure, Davidson and Stebbins (2011) explore what they term as Nature Challenge Activities. Nature Challenge Activities are leisure pursuits that are often pursued as serious leisure and place the participant in direct contact with a natural feature. In the case of a rock climber, this contact would be with a cliff, mountain or rock formation. Others participate in Nature Challenge Activities in the context of plants or animals such as birdwatchers or hunters, streams and rivers in the case of kayakers, or simply the air for those who chose to pursue skydiving or hang-gliding as their Nature Challenge Activity leisure pursuit (Davidson and Stebbins, 2011). In shaping their definition of Nature Challenge Activities, Davidson and Stebbins (2011), pay close attention to the relationship these leisure participants have with the natural world beyond their primary interaction as defined by the challenge they face in their specific leisure context. They note that Nature Challenge Activity participants, regardless of their specific leisure pursuit, make for excellent advocates of sustainability (Davidson and Stebbins, 2011). Davidson and Stebbins (2011) draw upon historical patterns in which early serious Nature Challenge Activity leisure participants made efforts to curb development and commercialization of wilderness landscapes in which they recreated. Finally, in a more modern context, Davidson and Stebbins (2011) conducted a survey of websites for various Nature Challenge Activity clubs and organizations and concluded that regardless of the specific activity; whether it be ATV

usage or rock climbing, these organizations uphold some code of conduct, that is often in line with the seven principles of Leave No Trace: 1) Plan ahead and prepare, 2) Travel and camp on durable surfaces, 3) Dispose of waste properly, 4) Leave what you find, 5) Minimize campfire impacts, 6) Respect wildlife, and 7) be considerate of other visitors (.). Though these seven principles are often edited or customized to fit more precisely with a specific leisure pursuit, Davidson and Stebbins (2011) contend that, even though, Nature Challenge Activities pose an inherent impact upon the resource in which a leisure pursuit is taking place, those who participate in serious leisure in the form of a Nature Challenge Activities have motivation and reason to show concern for and strive to protect the resource in which they recreate. To conclude their survey of Nature Challenge Activities and serious leisure, Davidson and Stebbins (2011) reference the lack of consistent conclusions amongst researchers in regards to the relationship between outdoor recreation participation and environmental concern; however, they maintain that Nature Challenge Activity participants have a long-history of advocacy for the environment and the places in which they challenge nature as a form of serious leisure.

In summary, this review served to develop an understanding of environmental concern as a factor within the human-nature interaction and the different strategies that have been used to assess this connection and its various factors. It has surveyed the literature surrounding place attachment and serious leisure as they pertain to the development of environmentally responsible behavior and environmental concern, and the potential relationships that exist amongst these variables. An examination of the mediation effect of place attachment on serious leisure participation and environmental

concern is both logical and may prove as a beneficial to the literature surrounding, place attachment, environmentalism and serious leisure and the implications regarding the broader relationship, the nature of which is still continuously questioned in the literature, between outdoor recreation participation and environmental concern. As the finger of blame for environmental degradation shifts from industry to individual (Thogerson 2009), it becomes more and more apparent that practitioners and policy makers need to possess an understanding of what facilitates a growth of environmental concern in order to promote a new cultural map or worldview aimed at preservation of the planet and its level of habitability.

Research Hypotheses

In consideration of the literature reviewed, three hypotheses were developed to explore the relationships amongst the described variables.

H₁: Participation in serious leisure will result in increased levels of environmental concern amongst rock climbers in the Shawangunks.

H₂: Participation in serious leisure will result in increased levels of place attachment to the Shawangunks amongst climbers therein.

H₃: Environmental concern amongst climbers in the Shawangunks will be mediated by place attachment predicted by participation in serious leisure.

Chapter 3: Methods

The purpose of this study was to investigate the effect of level of serious leisure participation, mediated by place attachment, on environmental concern among rock climbers in the Shawangunks. The following chapter details the steps taken in collecting and analyzing the data that allowed for the undertaking of a mediation analysis. This chapter provides description, not only of where the study took place and who participated in the study, but also of the intentions of the researcher, the various measurement tools used to capture pertinent constructs, and procedures used for quantitative data analysis.

Setting

The Shawangunk Mountains (Gunks) in New Paltz, New York have a rich history of outdoor and adventure recreation. With miles of hiking trails and roughly 1200 rock climbing routes at seven cliffs, the recreational resources in and around New Paltz attract outdoor enthusiasts from around the state, region, country and globe. All visitors, independent of their intended activity, must pay a daily use fee, become a member of the Mohonk Mountain Preserve or be a guest of the Mohonk Mountain House in order to enter the area. One of the most popular draws to the Mohonk Mountain Preserve is the rock climbing, which caters to the traditional style of climbing. This style involves climbing rock formations with no pre-placed protection. Climbers must place their own spring-loaded camming devices (SLCDs) or nuts and chocks in order to safely ascend the rock formations. This type of climbing has the perception of being more dangerous because the responsibility for mitigating the length of a fall is more directly in the hands of the climber.

As a climbing destination, the Gunks offer climbs ranging in difficulty from extremely easy to extremely difficulty. With the diversity of climbing routes available, the Gunks serve as an excellent resource where beginner climbers can develop their skills, and more advanced climbers continue to master the subtleties of traditional rock climbing and maintain an excellent level of climbing fitness. This range in route difficulty helps to attract a diverse populous of climbers to the area from all over the world.

Participants

Participants were approached and questionnaires distributed to rock climbing participants as they prepare to engage in their recreation activity, are actively engaging in or show signs of having completed a day of climbing. Therefore, this study engaged convenience sampling carried out at appropriate sites of interest to the population in which the primary investigator was interested. After obtaining a freeware download of G Power Analysis 3.1.3, the primary investigator conducted a power analysis to determine desired sample size. Using an effect size of .15, an alpha of .05, and a 95% confidence interval, the primary investigator determined that a sample size of 89 would be needed for the purposes of the mediation analysis. In order to account for potential unusable questionnaire data due to misunderstanding or incompleteness, the primary investigator sought to collect questionnaires from at least 100 rock climbers.

The following study comprised a sample of 151 traditional rock climbers (74% male; 36% female). The age of climbers ranged from 18 to 70 ($M = 33$). Climbers reported residence in 15 states and 5 countries ($n = 6$). The most commonly reported residences were: New York State ($n = 86$), Pennsylvania ($n = 17$) and New Jersey ($n =$

11). In regards to the highest degree attained, approximately 48% of climbers reported they had earned a bachelor's degree and 32% had earned a master's degree. Climbers were also asked to provide self-reported climbing ability from (1) beginner ($n = 8$) (2) novice ($n = 15$) (3) intermediate ($n = 67$) (4) advanced ($n = 45$) (5) expert ($n = 15$).

Among respondents, the average number of days spent climbing in the Gunks per year was 32.64. Participant recruitment occurred at trailheads, parking areas and cliffs where climbing activities were taking place. All participants who volunteered for the study first had to complete the study's consent document (see Appendix A) in accordance to the university's institutional review board.

Procedures for Data Collection

The researcher approached participants and asked if they would be interested in completing a questionnaire that examined the relationship between participation in rock climbing and people's level of environmental concern. At this time participants had the opportunity to decline or defer their participation in the study. If they declined participation, they were thanked and left to complete their activity. If they accepted the invitation to participate they were administered an informed consent document and questionnaire. Study participants were then encouraged to read through the consent form and questionnaire. If, having read these documents, they still maintained an interest in participating in the study; they then signed the consent form and were presented with an opportunity to ask any questions to the primary investigator regarding the study and questionnaire. After the primary investigator answered any and all questions to a sufficient level, the interest of the participant in completing the study was once again

confirmed. Participants were reminded that they were able to cease participation at any time during the study. Participants then completed the questionnaire. After the completion of the questionnaire, the primary investigator collected and safely filed away all documents. The participants were thanked and encouraged to enjoy the rest of their recreation activity. After collecting surveys through this convenience sampling process, quantitative data was organized, processed and interpreted using SPSS. The data collected in surveys was not linked to survey participants. The names and identities of participants were not documented on the survey, nor do they appear in any reporting herein.

Research Design

Data collection took place between July 19, 2012 and August 14, 2012 at cliffs throughout the Mohonk Mountain Preserve in the Gunks. Participants completed a questionnaire comprised of three distinct instruments. Those instruments included the Serious Leisure Instrument and Measure (SLIM), a measure of Place Attachment and the New Ecological Paradigm Scale. In order to create a questionnaire that would decrease the likelihood of participant response bias, all of the items from each of the above scales were randomly intermixed to form a composite 45 item scale (see Appendix B). In using this approach, there was less potential for a participant to respond in a certain way based on proximity of similar themed questionnaire items. Sum scores from each of the individual instruments provided a means from which to test each of the study's stated hypotheses. See Appendix C for basic questionnaire content organized by theme and original scale.

Measurement

The following study made use of three primary measurement scales in order to test the study's stated hypotheses. The SLIM focused on assessing participants' level of leisure participation in the sport of rock climbing. Drawing from Stebbins (1982; 1992; 1997) conceptual framework regarding a continuum of 'seriousness' in regards to level of participation, the scale evaluated the degree of seriousness with which a participant approached the leisure pursuit of rock climbing. The Place Attachment Scale evaluated the degree to which a person had developed or possessed a sense of attachment to the Shawangunk Mountain Area. The third and final scale used was the NEP scale. This measure provided an indicator to a person's level of environmental concern.

Collectively, the data provided by these three instruments allowed the primary investigator to test the extent to which a person's level of place attachment served as the generative mechanism by which leisure participation influenced people's level of environmental concern. A more detailed description of each instrument follows.

SLIM. Gould, Moore McGuire and Stebbins (2008) developed the (SLIM) as a 54-item scale that exhibited acceptable fit and reliability in addressing 18 dimensions of the six criterion of serious leisure (Stebbins, 1992; Green and Jones, 2005). Gould, Moore, Karlin, Gaede, Walker and Dotterweich (2011) updated and consolidated the 54-item measure to an 18 item scale called SLIM which tested as reliable with a Cronbach's alpha of .96. Gould, et al. (2011) reported high validity and reliability of the 18-item SLIM in quantifying the six dimensions of serious leisure as highlighted in previous literature (Gould, Moore, McGuire, & Stebbins, 2008; Stebbins, 1992; Green & Jones, 2005). In

order to address serious leisure within the context of this study, the primary investigator employed the use of the 18 item SLIM. Although the 18-item SLIM tested by Gould et al. (2011) used a 9-point Likert scale, the present study adopted a 5-point Likert scale in order to provide consistency and prevent confusion amongst respondents. The scale ranged Strongly Disagree (1) to Strongly Agree (5). The intention underlying this change was to conform to a format consistent with Place Attachment and NEP scales, each of which used five-point scales.

Place Attachment. Over the past two decades a number of studies have investigated the construct of place attachment from recreation and tourist destinations perspectives (Williams, Patterson, Roggenbuck, & Watson, 1992; Moore & Graefe, 1994; Bricker & Kerstetter, 2000; Vaske & Kobrin, 2001). The place attachment segment of the questionnaire used in this study drew upon the framework laid out by Williams and Roggenbuck (1989) and then further validated and established by Williams and Vaske (2003). This instrument focuses on capturing the degree to which people's attachment to a place is a function of one of two dimensions, place dependence and place identity. Comprised of 12 items, the following scale uses six items to address place dependence and six items to address place identity (Williams & Vaske, 2003). For each item, participants provided a response rating denoting the extent to which they agree with the presented statement. Response ratings ranged from Strongly Disagree (1) to Strongly Agree (5). Williams and Vaske (2003) reported Cronbach's reliability estimates for their place attachment scale ranging from .81 - .94 at seven different study settings. Given the

instrument's history as a reliable measure within different settings, its use within the context of the present study seemed logical.

NEP Scale. In an effort to extrapolate from the work of previous studies regarding environmental concern, attitudes and behaviors (Thapa, 2010); the construct of environmental concern was addressed using the 15-item NEP scale (Dunlap, et al., 2000). Researchers continue to engage the revised NEP scale as an international measure of environmental concern, values and beliefs (Dunlap, 2008). The NEP scale uses a five-point Likert scale format ranging from Strongly Disagree (1) to Strongly Agree (5). Respondents who showed agreement with the odd numbered items and disagreement with the even numbered items are exhibiting environmental concern. This was done in accordance with the normalization of the New Ecological Paradigm Scale in 2000 (Dunlap, et al.). See Appendix C for details regarding which questionnaire items represent the different attitudes and beliefs represented by the New Ecological Paradigm scale as mentioned above. Dunlap (2008) reported that upon previous reliability testing, the NEP scale received a Cronbach's Alpha of .83, thus reporting good reliability.

Procedures for Data Analysis

Initial data analysis involved running descriptive statistics for the three variables of interest; level of leisure participation, place attachment and environmental concern in order to check for normality and to examine mean scores and standard deviations for the variables. In order to proceed with further data analysis, correlations were run between the three variables to provide evidence that a mediation test was in fact warranted.

Testing for Mediation. Testing each of the stated hypotheses required running a series of regression equations as outlined by Baron and Kenny (1986) and Kenny, Kashy and Bolger (1998). Data were analyzed in an effort to provide evidence of mediation effect by adherence to three conditions: (1) Serious Leisure Participation must affect Environmental Concern (2) Serious Leisure Participation must affect Place Attachment and (3) Place Attachment must affect Environmental Concern (Baron & Kenny, 1986; Thapa, 2010). This study employed a four step multiple regression mediation analysis based upon the framework of Kenny, Kashy and Bolger (1998).

In the first step of the mediation testing, environmental concern served as the outcome variable and serious leisure participation as the predictor variable (see Path C in Figure 1). This initial regression is especially important in order to establish that a relationship for potential mediation exists between predictor and outcome and that the variables are correlated (Kenny, Kashy & Bolger, 1998).

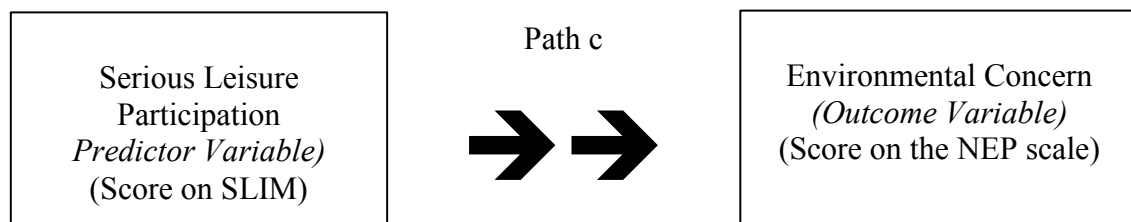


Figure 1. Diagram of Path c in Mediation Model

The next regression analysis engaged serious leisure as a predictor and place attachment as an outcome variable (see Path A in Figure 2) and showed that the mediator

(place attachment) is correlated with the predictor (serious leisure). In the third regression analysis, place attachment was used a predictor variable and environmental concern as an outcome variable (see Path B in Figure 2). In regards to mediation effect, correlation between the mediator (place attachment) and outcome (environmental concern) is not sufficient, because this correlation may be a function of the predictor variable (serious leisure) affecting both mediator and outcome. This regression also simultaneously serves to estimate the size of the relationship between serious leisure participation and environmental concern when controlling for place attachment (see Path C' in Figure 2). If a t-value of zero is established between predictor and outcome when controlling for the mediator variable, then the relationship indicates a full mediation effect (Baron & Kenny, 1986) If the t-value is critically reduced from Path C to C' and changes from being statistically non-significant to statistically significant, then there is evidence for a partial mediation effect (Baron & Kenny, 1986).

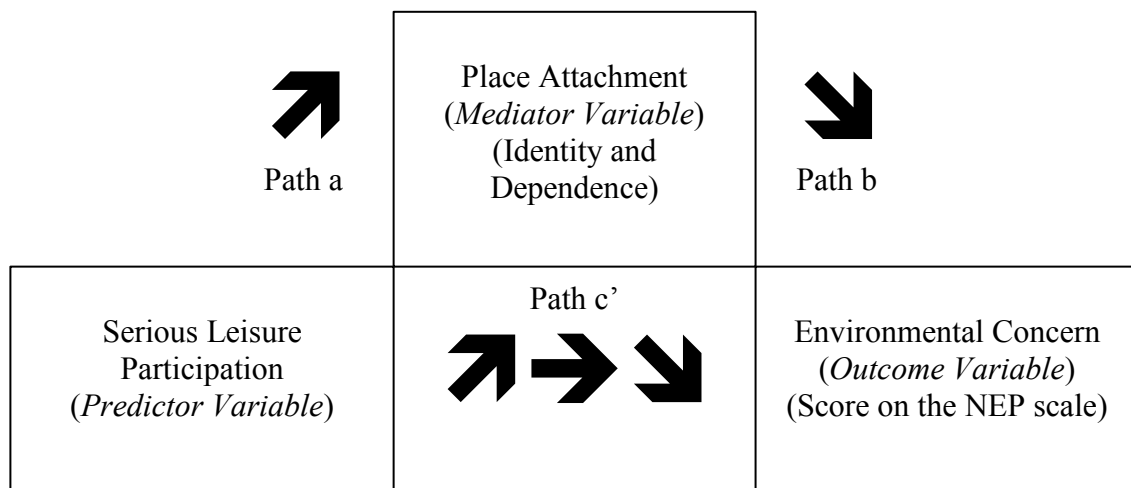


Figure 2. Theoretical Mediation Model of Place Attachment on Serious Leisure and Environmental Concern.

For the purpose of this mediation analysis: Serious Leisure participation served as a predictor variable, Environmental Concern as measured by scores on the NEP scale served as a criterion variable and Place Attachment served as the mediator variable. If statistical significance is found within path a, path b and path c then, the effect of Serious Leisure participation on Environmental Concern must be lower when Place Attachment is accounted for (Fairchild & MacKinnon, 2009).

In regards to the role of place attachment as a mediator variable: If Place Attachment is a singular mediating variable, then the link between Serious Leisure (predictor variable) and Environmental Concern (outcome variable) will be reduced to zero when Place Attachment is controlled. If Place Attachment is only a partial mediator, then the link between Serious Leisure (predictor variable) and Environmental Concern (outcome variable) will appear as a lesser value, but will remain significant when controlling for Place Attachment (mediator variable) (Kuo, 2001).

Chapter 4: Results

This study employed the use of a questionnaire aimed at investigating the effect that levels of serious leisure participation, mediated by place attachment, had on environmental concern amongst climbers in the Shawangunks. To accomplish this aim, the present study utilized the Serious Leisure Inventory and Measure (SLIM) (Gould, et al., 2011), the Place Attachment Scale (Williams & Vaske, 2003), and the New Ecological Paradigm Scale (NEP) (Dunlap, et al., 2000). Data analysis involved summing and averaging participants' scores for each of the three scales. This in turn produced a mean score for each participant for the variables of serious leisure participation, place attachment and environmental concern. In the case of all three variables, possible scores ranged from 1 to 5, 1 showing a low level of the variable and 5 showing a high level. This study initially posed three hypotheses, each of which was critical to determining the potential for mediation. After running initial analysis, the researcher discovered that the relationship between serious leisure participation and place attachment was very strong and worthy of further exploration. Therefore, this chapter will also present findings from a series of exploratory analyses that examined more closely the relationship between serious leisure participation and place attachment.

Descriptive Statistics

Upon initial review of data, descriptive analyses were conducting first to explore the reliability of the measurements used for serious leisure, place attachment and environmental concern in the context of this study. Further descriptive statistical analyses were run to examine the distribution of the sample in regards to normality,

skewness, and kurtosis. This also allowed for the summing of and production of a mean score for each of the three variables examined. See Table 1 for results of these descriptive analyses.

Table 1. Descriptive Statistics: SLIM, Place Attachment and NEP

Scale	Items	Cronbach's Alpha	Mean	SD	Range	Skewness	Kurtosis
SLIM	18	.88	4.09	.48	2.39 - 5.00	-.454	.269
Place Attachment	12	.89	3.43	.70	1.45 - 4.73	-.670	.218
NEP	15	.84	3.81	.58	1.60 - 5.00	-.790	1.44

Bivariate Correlation Analysis. Justification for conducting mediation analysis was attained based on establishing correlation between the three variables. The correlation between SLIM score and Place Attachment score was significantly at an alpha level of .01 ($r = .54$). Place Attachment score and NEP were significantly correlated at an alpha level of .05 ($r = .19$). SLIM scores and NEP score were correlated at an alpha level of .05 ($r = .17$).

Hypothesis Testing

Test for Mediation. In accordance with the steps outlined by Kenny et al. (1998), testing for mediation involves running a series of regression analyses. The first equation regressed environmental concern (outcome variable) on serious leisure participation (predictor variable). The intention here was to determine if there was, in fact, a direct

effect to mediate. As hypothesized, the unstandardized coefficient ($B = .210$) was significant ($p < .05$). Although there was evidence of a direct effect between serious leisure participation and environmentalism (Path C), the effect size was rather small ($R^2 = .03$). Having met the initial requirement for mediation, the second analysis regressed place attachment (outcome variable) on serious leisure participation (predictor variable). Evidence from that analysis indicated that there was a direct and significant effect in Path A ($B = .798, p < .001$). It is within Path A where the data shows the largest effect size ($R^2 = .292$).

Path B was then assessed using environmental concern as an outcome variable and place attachment as a predictor variable in a third regression. For the third time, evidence garnered from the data indicated a direct and significant effect ($B = .158, p < .05$). However, much like the case in Path C, the relationship in Path B though statistically significant, demonstrated a rather small effect size ($R^2 = .04$). Therefore, the first three steps of mediation analysis as outlined by Baron and Kenny (1986) regarding direct and significant effects were satisfied. This third regression also provides insight as to the direction and significance of the relationship between serious leisure participation and environmental concern when controlling for place attachment (Path C'). If a full or partial mediation effect existed, the value of that path would be equal to or near zero; however, this sample did not provide such evidence. Table 2 presents the results of each regression analyses run in order to test for mediation.

Table 2. Testing the Mediation Model: Multiple Regression Analyses

	B	SE B	beta	t	Sig.	R ²	F
Path C							
Outcome: Environmental Concern Predictor: Level of Participation	.210	.097	.174	2.160	.032*	.03	4.665
Path A							
Outcome: Place Attachment Predictor: Level of Participation	.789	.101	.540	7.836	.000**	.29 2	61.339
Path B							
Outcome: Environmental Concern Predictor: Place Attachment	.158	.066	.191	2.381	.019*	.03 7	5.668
Path B and C'							
Outcome: Environmental Concern Mediator: Place Attachment Predictor: Level of Participation	.114 .121	.079 .115	.137 .100	1.438 1.047	.297 .152	.04 4	3.384

*Sig at $p < .05$ **Sig at $p < .001$

In regards to the null hypotheses the following decisions were made:

H₀₁: Participation in serious leisure will not result in increased levels of environmental concern amongst rock climbers in the Shawangunks. – null rejected; however, the effect size reported was very small, accounting for only 3% of predictability between serious leisure participation and environmental concern.

H₀₂: Participation in serious leisure will not result in increased levels of place attachment to the Shawangunks amongst climbers therein – null rejected. The rejection of this null hypothesis motivated the researcher to explore this relationship more deeply. These results are reported in the following section.

H₃: Environmental concern amongst climbers in the Shawangunks will not be mediated by place attachment predicted by participation in serious leisure. – fail to reject.

Exploratory Analyses

Based on results obtained from testing or mediation, the researcher carried out additional analyses to gain further depth of understanding. Those analyses focused on examining the relationship between serious leisure participation and place attachment. Place attachment is comprised of two dimension; dependence and identity. In an effort to better understand the effect serious leisure participation had on place attachment, the effect of serious leisure participation on each of these two dimensions was explored. A sum score for the items dedicated to dependence and identity were calculated and using these scores, the researcher separately regressed place dependence and place identity on serious leisure participation. When regressing place dependence on serious leisure participation, this researcher obtained evidence of a direct, significant effect ($B = 0.476$, $p < .001$). Responses in this sample indicated that serious leisure participation can account for 13% of the variance in place dependence scores ($R^2 = 0.131$) When regressing place identity on serious leisure participation, the data provided evidence of an even stronger relationship ($B = 1.164$, $p < .001$, $R^2 = .346$) (see Table 3). Given these results, the researcher conducted a follow-up analysis that examined how different aspects of a leisure career may influence people's place dependence and identity.

Table 3. Regression of Level of Participation on Place Attachment Factors

	B	SE B	beta	t	Sig.	R ²	F
Outcome: Place Dependence Predictor: Level of Participation	.476	.101	.362	4.733	.000**	.131	22.399
Outcome: Place Identity Predictor: Level of Participation	1.164	.131	.588	8.879	.000**	.346	78.841

**Sig at $p < .001$

In order to examine the effect that different stages of a serious leisure career had on place dependence and identity scores, the researcher group SLIM scores into quartiles. These quartiles were then analyzed regarding place dependence and place identity scores (see Table 4).

Table 4. Place Dependence and Identity across SLIM Quartiles

SLIM Quartile	N	Mean Place Dependence	SD	Mean Place Identity	SD
1	37	2.932	.590	2.957	.960
2	33	3.066	.641	3.539	.835
3	43	3.361	.574	4.023	.666
4	38	3.333	.634	4.253	.814

A MANOVA analysis was conducted in order to verify that place dependence and place identity scores were significantly different across SLIM quartiles. Evidence was provided that based on SLIM quartile, 8% of the variance on place dependence scores could be explained ($p < .01$, $df = 3$, $F = 4.426$, $\eta^2 = .083$). In regards to place identity, this sample indicates that 27% of variance on respondents scores could be accounted for based on SLIM quartile ($p < .001$, $df=3$, $F = 18.536$, $\eta^2=.274$). Having obtained evidence indicating that participant scores on place identity and place dependence were statistically different based on SLIM quartile; the researcher then conducted pairwise comparisons to explore between what quartiles mean differences were most substantial. Table 5 illustrates the major findings from these pairwise comparisons.

Table 5. Pairwise Comparison: Place Attachment Factors across SLIM Quartiles

	SLIM Quartile (i)	SLIM Quartile (j)	Mean Difference (i-j)	SE	Sig.
Place Dependence	1	3	-.428	.137	.013*
	1	4	-.401	.142	.032*
Place Identity	1	2	-.582	.196	.021*
	1	3	-1.066	.184	.000**
	1	4	-1.296	.189	.000**
	2	4	-.713	.195	.002*

*Sig at $p < .05$ **Sig at $p < .001$

Expounding Upon the SLIM

In an effort to validate the use of the SLIM, the researcher examined certain variables thought to influence a person's level of serious leisure participation. For example, number of climbing days in the Gunks per year. It is logical that a person who climbs regularly is likely to have advanced their skills, knowledge and passions to a level beyond that of the casual leisure participant. Self-reported climbing ability was quantified on a scale consisting of: 1) Beginner 2) Novice 3) Intermediate 4) Advanced 5) Expert. The following analysis met the assumption of normality based on Levene's Test of Equality of Error Variance. Testing the null hypothesis that the error variance of number of climbing days per year is equal across the route was rejected ($F=7.152$, $p<.001$). As one might logically expect, differences in mean climbing days increased as self-reported climbing ability increased (See Table 6).

Table 6. Mean Climbing Days and Self-Reported Climbing Ability

Climbing Ability	Mean Climbing Days/Year	S.D.	N
Beginner	5.875	7.199	8
Novice	7.000	14.923	15
Intermediate	35.731	28.430	67
Advanced	37.333	39.733	45
Expert	89.333	57.910	15

In examining pairwise comparisons, statistically significant mean differences were found amongst all levels of self-reported climbing ability except beginner to novice, beginner to intermediate, novice to intermediate and intermediate to advanced. (See Table 7)

Table 7. Pairwise Comparison: Climbing Days and Self-Reported Climbing Ability

Climbing Ability (i)	Climbing Ability (j)	Mean Difference
Beginner	Advanced	-31.458*
Beginner	Expert	-83.458**
Novice	Advanced	-30.333*
Novice	Expert	-82.333**
Intermediate	Advanced	-63.602**
Advanced	Expert	52.000**

*Sig at $p < .05$

**Sig at $p < .001$

A second ANOVA analysis examined differences in SLIM scores based on self-reported climbing ability. Evidence was provided that a statistically significant difference in SLIM scores existed based on self-reported climbing ability ($F=17.065$, $p<.001$, $\text{Eta}^2=.320$). Significant differences in mean differences of SLIM scores existed amongst all self-reported ability levels in the pairwise comparison except beginner and novice and advanced and expert. Therefore, based on this sample one can ascertain that rating serious leisure on the SLIM scale and self-reported climbing ability seem consistent and logical; as one becomes a more serious participant in climbing, one also tends to provide a higher level of self-reported climbing ability. When considering that those reporting higher climbing ability also report more climbing days per year, the consistency seems to carry through to Stebbins' (1992) perseverance criterion for participation in serious leisure.

Chapter 5: Discussion

The aim of this research was to investigate the extent to which serious leisure participation could predict the level of environmental concern held by rock climbers in the Shawangunk Mountain area. Place attachment served as the conceptual link between each of these two constructs. Evidence obtained from earlier studies has suggested that people who have a sense of attachment to a specific place tend to demonstrate more environmentally responsible behaviors (Vaske & Kobrin, 2001). Behaviors of this sort are largely derived from a person possessing certain values, beliefs, and attitudes about the natural world (Edwards, 2005).

This study conjectured that serious leisure participation would play an instrumental role in the formation of an attitude indicative of a person who possessed a high level of environmental concern. As a person becomes a more ‘serious’ climber, the frequency with which he or she interacts with the outdoor environment tends to increase. Through such regular interactions, many people develop a sense of attachment to the settings they visit (Williams & Vaske, 2003). As said previously, that attachment can lead a person to become a greater advocate and steward of the outdoor environment, or what that outdoor environment represents. This chapter discusses the results of the study in more detail, presents certain study limitations, offers possible directions for future research, and some potential implications for practice.

Interpretation of Results

Within the current literature, researchers have reported mixed views on the relationship between outdoor recreation participation and environmental concern.

Currently, the described relationship is being met with mixed results in the literature. Berns and Simpson (2009) liken that relationship to the classic quandary regarding the chicken and the egg. From their perspective, research has yet to indicate whether recreation participation leads a person to environmentalism or vice-versa. This study was unable to illustrate that the effect serious leisure participation had on a climber's level of environmental concern occurred as a result of the proposed mediating variable, place attachment. In regards to the direct relationship between serious leisure participation and environmental concern, there was a very small effect size and therefore, this researcher is left with little confidence in reporting that serious leisure participation is a strong factor in contributing to the development of environmental concern. Therefore, the question remains as to what might be done in order to foster environmental concern amongst citizens. Perhaps greater effort might be devoted to examining educational backgrounds, upbringing, or personal ideology as factors leading to the development of environmental concern.

Although evidence for a mediation effect did not exist, the quantitative data collected and analyzed for this study provides interesting insight into the relationship between serious leisure and the two factors that comprise place attachment. In light of the findings from this study there is certainly merit in continuing to explore the relationships between these constructs. As the finger of blame for environmental degradation shifts from industry to individual (Thogerson 2009), it becomes more and more apparent that practitioners and policy makers need to possess an understanding of what facilitates a growth of environmental concern in order to promote a new cultural map or worldview

aimed at preservation of the planet and its level of habitability for humankind. Potentially these findings serves as an indicator for practical improvements that might be made in community and educational programming that encourages individuals to go outside and recreate in such a way that forwards development in serious leisure careers so that place attachment and potentially environmental consciousness might flourish.

The responses of traditional rock climbers in the Shawangunks indicated that the correlative relationships necessary for conducting a mediation analysis were satisfied. Paths A, B, and C in the mediation model of this study were all shown to be direct and statistically significant. However, in both Path B and Path C, this effect size was very weak (Path A: $R^2 = .04$, Path C: $R^2 = .03$), and therefore able to account for only a small portion of outcome response variance. This may have partially accounted for the lack of full or partial mediation effect within this sample. This sample did not provide evidence of a sufficient reduction, nor was the reduction statistically significant, in the effect size between Path C and Path C'. One cannot conclude that place attachment does not play a role in the potential relationship between outdoor recreation participation and environmentalism. Though one cannot be certain that serious leisure participation and place attachment are more influential in predicting environmental concern than other variables that have been assessed regarding its fostering and proliferation, they can both certainly be identified as parts of this very complex process and relationship.

Shields and Zeng (2012) discussed gender as a variable that might influence levels of environmental concern. In their study, which was set in China, they found evidence that men are more likely to show higher levels of environmental concern

(Shields & Zeng, 2012). This is contradictory to previous evidence regarding gender and environmental concern, in which conclusions have been drawn stating that women are more likely to have higher levels of concern for the environment (Marshall, 2004; Kellstedt, Zahran & Vedlitz, 2008). Kellstedt, et al (2008) cite cultural structures regarding employment opportunities across gender as a predictor of higher levels of environmental concern in women; postulating that due to gender derived disadvantages in the work place, women are less likely to be faced with making decisions weighing economic growth and environmental degradation. The intricacy of this relationship begins to come to light even under this simple examination of the variable of gender; within this discussion two additional confounding variables present themselves, ethnicity and employment opportunities. Klineberg, McKeever and Rothenback (1998) explored the inconsistencies within the literature regarding factors that influence environmental concern and concluded that age and education provided reliable and consistent results as predictor variables. However, in regards to gender, ethnicity, income, size of municipality of residence and political ideology consistency could not be found in regards to the predictive value that these variables have for environmental concern (Klineberd, et al., 1998). As Berns and Simpson (2009) and the results from this study suggest, outdoor recreation participation ought to be on the list of inconsistent predictability. By attempting to further define outdoor recreation participation in the context of serious leisure participation, this study sought to provide evidence that specification of variables might make the predictive aspects of this relationship more consistent. However, as previous literature and the results of this study show, the human-

nature interaction and the concern that humans show for the environment is an incredibly complex construct, with a plethora of inconsistently predictable variables.

Study Limitations

Although this study resulted in a number of interesting findings, there are certain limitations worthy of consideration. These limitations should not be considered impediments to the implications of this research; nor should they stunt the pursuit of research amongst these variables in the future. However, their acknowledgement is an important component of the research process, not to belittle it, but to inspire it for the future.

In light of the limited scope to the setting of this study, there is of course a lack of generalizability regarding the population of rock climbers in general. This study served to explore simply one sample of potential serious leisure participants in rock climbing in the Shawangunks. By expanding this course of inquiry to international climbing destinations, or even climbing areas throughout the United States, one might actually gain unique perspective into some of the other variables (socio-economic, cultural, regional, etc...) that may influence environmental concern in general, as well as the relationship between serious leisure participation and environmental concern as mediated by place attachment. Expanding the geographic scope of the research may also help to clarify if a set of universally accepted ethics and norms may in fact exist amongst climbers or other groups of serious leisure participants.

A second limitation to the study involved the collapsing of the SLIM scale from a 9-point scale to a 5-point scale. Reformatting the scale provided consistency with the

other scales used in the survey instrument. The consequence of this decision was a limiting of the variance in participant responses as evidenced by the very high sample mean ($M = 4.09$) and a truncated range from only 2.39 – 5.00. By reducing the number of responses, the ability of the SLIM scale to distinguish between different kinds of serious leisure participants might have been diminished. Limiting the range of responses may also limit the amount of sensitivity, or ability to distinguish between participant responses, in assessing a given variable (Warner, 2013). Limiting the possible responses may also lead to ceiling effects (Warner, 2013). By shrinking the SLIM from a 9 point to 5 point Likert scale, this study may have lost some of its sensitivity in assessing serious leisure participation and the data reflects that a ceiling effect may have occurred for the variable.

A third potential limitation to the study was the use of the NEP scale as an indicator of the attitude of environmental concern. The contemporary applicability of NEP scale has been contested by a variety of authors (Nisbet, Zelenski, & Murphy, 2009; Mayer & Frantz, 2004; Perrin & Benassi, 2009; Hawcroft & Milford, 2010; Davis, Le & Coy, 2011). The use of a different scale may have affected the results of this study in such a way as to show more pronounced direct effects between variables and/or potential mediation effect. Also, by using the NEP scale, which is a measure of environmental attitudes, the researcher may have limited the potential for null hypothesis rejection from inception. Literature regarding place attachment (Williams & Vaske, 2003; Vaske & Kobrin, 2001) has discussed its relationship to environmentally responsible behavior, not necessarily the attitudinal construct of environmental concern. Previous research

regarding the role of outdoor recreation participation in environmentalism has reported that behavior may be a more fitting variable than attitude in exploring the potential relationship (Nord, et al, 1998; Theodori, et al, 1998). Therefore, the use of a different instrument that more effectively captures attitudes, or is designed to capture behavior, may be more appropriate.

Implications of Exploratory Findings

Bricker and Kerstetter (2000) explored the constructs of place attachment and recreation specialization amongst whitewater paddling enthusiasts. An interesting parallel exists between the findings of their 2000 study and this current study. In looking deeper into the relationship between serious leisure participation and place attachment, this study garnered evidence that as a participant becomes more serious in their leisure career their sense of place attachment tends to shift from one of mere dependence to that of the emotionally founded identity. Bricker and Kerstetter (2000) found in their study that whitewater recreation participants who were low in specialization were less likely to report feelings of place identity and more likely to experience place dependence. Therefore, when examining Bricker and Kerstetter's (2000) study in the context of the results of this study, the aforementioned linkage between serious leisure and recreation specialization becomes even more apparent. With recreation specialization acting as one of the integral theoretical links between serious leisure, place attachment and environmental concern in this study, the analogous implications for place identity development at the hand of recreation specialization and serious leisure development adds credence to the exploratory results of this study.

Directions for Future Research

Researchers should not become discouraged by inconsistent results regarding the relationship between outdoor recreation participation, specifically in the form of serious leisure, and environmental concern. Davidson and Stebbins (2011) present an intuitive logic that those who recreate in the natural world as a serious leisure participant often make upstanding leaders in environmentally concerned movements. However, they also acknowledge that these Nature Challenge Activity participants impose unavoidable impacts on the landscapes in which they recreate (Davidson & Stebbins, 2011).

Additionally, Davidson and Stebbins (2011) highlight the expressed interests' of Nature Challenge Activity participants to mediate the effects of their recreation so that they and future recreation participants may enjoy continued outdoor recreation opportunities (Davidson & Stebbins, 2011). Based on the findings of other studies regarding outdoor recreation and environmentalism and the findings of this study, it seems justified to conduct future research regarding the potential mediation effect of place attachment on serious leisure participation and environmentally responsible behavior, thus addressing some of the issues with the NEP and the measurement of environmental attitudes as discussed above.

Finally, the strength of the relationship exhibited in Path A between serious leisure participation and place attachment is both note-worthy and exciting. Place identity has been shown to predict environmentally responsible behaviors (Vaske & Kobrin, 2001). Therefore, in light of the evidence provided by this study that serious leisure participation can predict approximately 34% of variance in place identity,

justification certainly exists to continue to explore these relationships not only to provide robustness to the literature regarding outdoor recreation participation and environmentalism, but also to continue to expand and develop the literature regarding serious leisure. Once again, the significance of this finding holds not only exciting implications for the literature, but it may in fact inform practitioners, especially those who work at introducing new participants to outdoor recreation leisure careers. Based on these findings, practitioners should consider how they might most effectively design their programming to encourage the development of serious leisure and subsequent place identity and the associated positive environmental impacts.

Conclusion

According to the Outdoor Foundation (2011), roughly 6.9 million people took part in some form of rock climbing activity in 2009. This number is dwarfed by the growing planetary population that will have incredible influence on the human-environmental interaction of the 21st century; however, the implications of this study are not limited to rock climbers. From the practical standpoint, if practitioners and educators in outdoor recreation and education can begin to understand how to foster serious rather than casual participation in outdoor pursuits such as rock climbing, the evidence in this study suggests that those leisure participants will experience increased levels of place identity. This in turn, as documented by previous literature may result in the proliferation of environmentally responsible behavior (Williams & Vaske, 2003). Researchers in the past have acknowledged the importance of understanding the ways in which individuals identify with natural landscapes and garner a “sense of place” when they visit natural,

recreational resources (Bricker & Kerstetter, 2000, p. 233). This researcher agrees with these sentiments and encourages all professionals in the outdoor and adventure education industry to strive to encourage serious leisure and place attachment development so that the natural resources we enjoy today may be enjoyed by future generations of outdoor recreation enthusiasts.

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Appendix A: Participant Consent Form

Ohio University Consent Form

An Examination of a Gunk's climber's Relationship to the Natural World

Researchers: Richard Wilson and Dr. Andy Szolosi

You are being asked to participate in research. For you to be able to decide whether you want to participate in this project, you should understand what the project is about, as well as the possible risks and benefits in order to make an informed decision. This process is known as informed consent. This form describes the purpose, procedures, possible benefits, and risks. It also explains how your personal information will be used and protected. Once you have read this form and your questions about the study are answered, you will be asked to sign it. This will allow your participation in this study. You should receive a copy of this document to take with you.

Explanation of Study

This following study intends to examine the relationship between rock climbers and the natural world as experienced in the Shawangunks. If you agree to participate, you will be asked to complete a questionnaire that will provide information regarding your experiences in and relationship to the Shawangunks. Your participation in the study will last approximately 10 minutes, or as long as you require to complete the questionnaire.

Risks and Discomforts

No risks or discomforts are anticipated based on your participation in this study. However, if at any time during your completion of the survey you are uncomfortable in any way, your participation in this is entirely voluntary and can be terminated at any time.

Benefits

Your participation in this study may prove to make you more aware of your relationship to the Shawangunks as a recreation resource and inspire you to think about environmentalism. The results of this study may serve to benefit society by broadening the theoretical understanding of environmentalism, place attachment and serious leisure participation. This may serve to directly benefit both the natural world and humans who interact with it.

Confidentiality and Records

Your study information will be kept confidential. The only information linked

to survey responses will be activity type specified. You are not required to provide any contact information. Your name will appear on this document alone. Your name will be kept only as evidence that you were informed of the implications of this study and provided willing consent to participate in it.

Contact Information

If you have any questions regarding this study, please contact:

Richard Wilson
(315) 749 4980
rw157611@ohio.edu

or

Dr. Andy Szolosi
(740) 593 1757
szolosi@ohio.edu

If you have any questions regarding your rights as a research participant, please contact Jo Ellen Sherow, Director of Research Compliance, Ohio University, (740) 593-0664.

By signing below, you are agreeing that:

- you have read this consent form (or it has been read to you) and have been given the opportunity to ask questions and have them answered
- you have been informed of potential risks and they have been explained to your satisfaction.
- you understand Ohio University has no funds set aside for any injuries you might receive as a result of participating in this study
- you are 18 years of age or older
- your participation in this research is completely voluntary
- you may leave the study at any time. If you decide to stop participating in the study, there will be no penalty to you and you will not lose any benefits to which you are otherwise entitled.

Signature_____ Date_____

Printed Name_____

Appendix B: Questionnaire

Ohio University – Gladys W. and David H. Patton College of Education

This research study is part of a Masters' Thesis intending to examine environmental concern as experienced by rock climbers in the Shawangunks (Gunks). If you agree to participate, you will be asked to complete a questionnaire that will provide information regarding your rock climbing experiences in and relationship to the Gunks.

Participation in the study will last approximately 10 minutes, or as long as you require to complete the questionnaire. Thank you very much for giving up a few minutes of your day to participate in this study.

Please rate each of the following items on a scale of 1 to 5:

(1) Strongly Disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree

- | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. No other place can compare to the Gunks. | 1 | 2 | 3 | 4 | 5 | 10. Rock climbing for me is an expression of myself | 1 | 2 | 3 | 4 | 5 |
| 2. I share many ideals with other rock climbers. | 1 | 2 | 3 | 4 | 5 | 11. The things I do in the Gunks I would enjoy doing just as much at a similar site | 1 | 2 | 3 | 4 | 5 |
| 3. We are approaching the limit of the number of people the earth can support. | 1 | 2 | 3 | 4 | 5 | 12. I have received financial payment as a result of my rock climbing efforts. | 1 | 2 | 3 | 4 | 5 |
| 4. I try hard to become more competent in rock-climbing. | 1 | 2 | 3 | 4 | 5 | 13. Human ingenuity will ensure that we do NOT make the earth unlivable. | 1 | 2 | 3 | 4 | 5 |
| 5. The Gunks is the best place for what I like to do. | 1 | 2 | 3 | 4 | 5 | 14. There are defining moments within my rock-climbing experiences that have significantly shaped my involvement in it. | 1 | 2 | 3 | 4 | 5 |
| 6. It is important that I perform duties that unify my rock-climbing group. | 1 | 2 | 3 | 4 | 5 | 15. I identify strongly with the Gunks. | 1 | 2 | 3 | 4 | 5 |
| 7. Humans have the right to modify the natural environment to suit their needs. | 1 | 2 | 3 | 4 | 5 | 16. I enjoy interacting with other rock-climbing enthusiasts. | 1 | 2 | 3 | 4 | 5 |
| 8. I overcome difficulties in rock-climbing by being persistent. | 1 | 2 | 3 | 4 | 5 | 17. Humans are severely abusing the environment. | 1 | 2 | 3 | 4 | 5 |
| 9. When humans interfere with nature it often produces disastrous consequences. | 1 | 2 | 3 | 4 | 5 | | | | | | |

18. Others that know me understand that rock-climbing is a part of who I am.

1 2 3 4 5

19. The earth has plenty of natural resources if we just learn how to develop them.

1 2 3 4 5

20. I get more satisfaction out of visiting the Gunks than any other outdoor recreation area.

1 2 3 4 5

21. I feel that I have made progress in rock-climbing.

1 2 3 4 5

22. Plants and animals have as much right to exist as humans.

1 2 3 4 5

23. I demonstrate my skills and abilities when rock climbing.

1 2 3 4 5

24. I feel the Gunks are a part of me.

1 2 3 4 5

25. Rock climbing is enjoyable to me.

1 2 3 4 5

26. The balance of nature is strong enough to cope with the impacts of modern industrial nations.

1 2 3 4 5

27. Doing what I do in the Gunks is more important to me than doing it in any other place.

1 2 3 4 5

28. I make full use of my talent when rock climbing.

1 2 3 4 5

29. Rock climbing has improved how I think about myself.

1 2 3 4 5

30. Despite our special abilities humans are still subject to the laws of nature.

1 2 3 4 5

31. Rock climbing provides me with a profound sense of satisfaction.

1 2 3 4 5

32. I wouldn't substitute any other area for doing the types of things I do in the Gunks

1 2 3 4 5

33. The so-called "ecological crisis" facing humankind has been greatly exaggerated.

1 2 3 4 5

34. I am very attached to the Gunks.

1 2 3 4 5

35. Rock climbing has added richness to my life.

1 2 3 4 5

36. The earth is like a spaceship with very limited room and resources.

1 2 3 4 5

37. Humans were meant to rule over the rest of nature.

1 2 3 4 5

38. The Gunks are very special to me.

1 2 3 4 5

39. The balance of nature is very delicate and easily upset.

1 2 3 4 5

40. I feel revitalized after rock climbing.

1 2 3 4 5

41. Visiting the Gunks says a lot about who I am.

1 2 3 4 5

42. Humans will eventually learn enough about how nature works to be able to control it.

1 2 3 4 5

43. If things continue on their present course, we will soon experience a major ecological catastrophe.

1 2 3 4 5

44. I feel important when I am a part of my rock-climbing group's accomplishments.

1 2 3 4 5

45. The Gunks mean a lot to me.

1 2 3 4 5



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Please provide the following basic demographic information:

Gender: _____ Age: _____

Resident State and Country: (ex: New York, USA) _____

Number of climbing days in the Shawangunks/year: _____ (estimate exact number of days)

Circle highest degree attained:

High School Associates Bachelor Masters Terminal

Circle how you would best describe your climbing ability/experience:

Beginner Novice Intermediate Advanced Expert

Appendix C: Individual Measures and Comprising Factors

Each of these items will be assessed on a scale of 1 to 5:

(1) Strongly Disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree

*Factors appear as **bold** text with the items addressing them listed below.

New Ecological Paradigm Scale:

Limits to Human Carrying Capacity

- 1. We are approaching the limit of the number of people the earth can support.
- 6. The earth has plenty of natural resources if we just learn how to develop them.
- 11. The earth is like a spaceship with very limited room and resources.

Rejection of Human Separation From and Superiority Over the Rest of Biotic Community

- 2. Humans have the right to modify the natural environment to suit their needs.
- 7. Plants and animals have as much right to exist as humans.
- 12. Humans were meant to rule over the rest of nature.

Fragility of the Natural World

- 3. When humans interfere with nature it often produces disastrous consequences.
- 8. The balance of nature is strong enough to cope with the impacts of modern industrial nations.
- 13. The balance of nature is very delicate and easily upset.

Buffering Against Environmental Harm and Degradation Through Human Exceptionalism and Ingenuity

- 4. Human ingenuity will ensure that we do NOT make the earth unlivable.
- 9. Despite our special abilities humans are still subject to the laws of nature.
- 14. Humans will eventually learn enough about how nature works to be able to control it.

Likelihood of an Environmentally Catastrophic Event

- 5. Humans are severely abusing the environment.
- 10. The so-called "ecological crisis" facing humankind has been greatly exaggerated.
- 15. If things continue on their present course, we will soon experience a major ecological catastrophe.

Place Attachment:

Place Identity

- 16. I feel the Gunks are a part of me.
- 17. The Gunks are very special to me.
- 18. I identify strongly with the Gunks.
- 19. I am very attached to the Gunks.
- 20. Visiting the Gunks says a lot about who I am.

21. The Gunks mean a lot to me.

Place Dependence

22. The Gunks is the best place for what I like to do.

23. No other place can compare to the Gunks.

24. I get more satisfaction out of visiting the Gunks than any other outdoor recreation area.

25. Doing what I do in the Gunks is more important to me than doing it in any other place.

26. I wouldn't substitute any other area for doing the types of things I do in the Gunks

27. The things I do in the Gunks I would enjoy doing just as much at a similar site

Serious Leisure:

Perseverance

1. I overcome difficulties in rock-climbing by being persistent.

Personal Effort

2. I try hard to become more competent in rock-climbing.

Career (Progress and Contingencies)

3. I feel that I have made progress in rock-climbing.

4. There are defining moments within my rock-climbing experiences that have shaped my significant shaped my involvement in it.

Identity w/pursuit

5. Others that know me understand that rock-climbing is a part of who I am.

Unique Ethos

6. I share many ideals with other rock climbers.

Durable Outcomes

7. Rock climbing has added richness to my life.

8. I make full use of my talent when rock climbing.

9. I demonstrate my skills and abilities when rock climbing

10. Rock climbing for me is an expression of myself.

11. Rock climbing has improved how I think about myself.

12. Rock climbing provides me with a profound sense of satisfaction.

13. Rock climbing is enjoyable to me.

14. I feel revitalized after rock climbing.

15. I have received financial payment as a result of my rock climbing efforts.

16. I enjoy interacting with other rock-climbing enthusiasts.

17. I feel important when I am a part of my rock-climbing group's accomplishments.

18. It is important that I perform duties that unify my rock-climbing group.

Appendix D: IRB Approval Letter**OHIO**
UNIVERSITYOffice of the Vice President for
Research**12E174**Office of Research Compliance
RTEC 117
Athens, OH 45701-2979T: 740.593.0664
F: 740.593.9838
www.research.ohio.edu

A determination has been made that the following research study is exempt from IRB review because it involves:

Category 2 - research involving the use of educational tests, survey procedures, interview procedures or observation of public behavior

Project Title: Investigating the Effect of Serious Leisure Participation, Mediated by Place Attachment, on Levels of Environmental Concern Amongst Rock Climbers

Primary Investigator: William Richard Wilson

Co-Investigator(s):

Advisor: Andy Szolosi
(if applicable)

Department: Recreation and Sports Pedagogy

Rebecca Cale, AAB, CIP
Office of Research Compliance

Date

The approval remains in effect provided the study is conducted exactly as described in your application for review. Any additions or modifications to the project must be approved (as an amendment) prior to implementation.



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