

Environmental Ethics of Rock Climbers in the Adirondacks: A Quantitative Approach

by

Dr. James A. Harding, Associate Professor of Recreation and Natural Resources Management, Green Mountain College, Poultney, VT 05764 (hardingj@greenmtn.edu)

Dr. Tom Stuessy, Assistant Professor of Adventure Recreation, Green Mountain College, Poultney, VT 05764 (stuessyt@greenmtn.edu)

Differences in environmental ethics across user groups have long been established. What is new is the differences in environmental ethics within a user group--in this case rock climbers in the Adirondacks. This study attempts to capture the subtle and divergent qualities of environmental ethics by focusing on a range of foundational aspects evident in the field, such as degrees of non-anthropocentrism, zoocentrism versus ecocentrism, and religiously based obligations towards nature. Responses to these foundational aspects were then statistically analyzed, through Exploratory Factor Analysis, to reveal specific "flavors" of environmental ethics. A sample of rock climbers (N=70) in the Adirondacks provided the context in which to understand environmental ethics for this study. A key assumption in this study was that the style, type, and location of training that novice climbers receive affects their environmental ethics. Particular attention was paid to synthetic (i.e., indoor) versus natural methods of introduction to the sport of rock climbing and different approaches to participation. A factor analysis of the data allowed for a new configuration of environmental ethics to emerge and for distinctions in ethics across types of climbers to be considered. Indeed, rock climbers, even within a small area in the Adirondacks are not a homogeneous group with respect to their environmental ethics. Three factors emerged from the analysis: A Practical, Weak Non-Anthropocentric Environmental Ethics, A Metaphysical Holistic Environmental Ethics, and A Religiously Inspired Soft-Anthropocentric Environmental Ethics. Individuals who subscribe to each of these "flavors" of environmental ethics demand different sorts of considerations regarding their values and their obligations. As a result, management implications based on these different configurations of environmental ethics and of differences in ethics based on climbing types are explored.

Key Words: Anthropocentrism, biocentrism, ecocentrism, pragmatism, empirical,
environmental ethics, factor analysis, rock climbing, Adirondacks

INTRODUCTION

Environmental ethics in outdoor recreation has only recently received critical attention from the research community (Borrie & Harding 2002). A number of factors have combined to inhibit detailed, statistical analysis of this topic; specifically the persistent debate on the appropriate scope, scale, and dimensions of environmental ethics. In other words, even among environmental philosophers there continues to be disagreement on the very nature of environmental ethics (Callicott 1980). Indeed a cursory review of the table of contents of any environmental ethics textbook reveals a wide range of ethical theories, philosophical commitments, and moral community members (Des Jardins 2001, Pojman 1998, van de Veer and Pierce 1998). This then, is the starting point for research into the field of environmental ethics—research which considers degrees of non-anthropocentrism, zoocentrism versus ecocentrism, tensions between a deontologically-based system of duties and a utilitarian calculus analyzing benefits and costs. Specifically, our environmental ethics equation considers those items exactly, in addition to appeals to other forms of commitment such as religious obligations, the extent to which non-human nature was seen as complementary to or competing with modern human life, and whether the consideration of environmental ethics is not merely an intellectual, academic exercise but a problem-solving endeavor.

The primary purpose of this research was to study the topic of environmental ethics through the lens of rock climbers in the Keene Valley region of the Adirondack High Peaks. Specifically, we planned to measure the environmental ethics of these rock climbers through the use of a previously tested environmental ethics scale (Minteer and Manning, 1999). This scale references particular differences in standard environmental

ethics positions. For example, there are questions that address deontological, zoocentric ethics; there are questions that address utilitarian anthropocentric ethics; and there are questions that address ecocentric sentiments.

Keene Valley in the Adirondack High Peaks region is a popular rock climbing destination in the northeast United States. A sample of rock climbers (N=70) in the Adirondacks provided the context in which to study environmental ethics for this project. Along with the range of generally discussed environmental ethics scale items, particular attention was paid to assorted introductory and participatory differences among rock climbers. Specifically, we examined how climbers differed based on their mode of introduction to the sport: Did they start climbing in a natural environment or a synthetic environment? Were they formally instructed or informally taught? Further, we asked about their current preferences and approaches to participation (traditional versus sport climbing, and indoor versus outdoor). Additionally, we gathered typical socio-demographic information.

In an effort to understand the multiple dimensions of environmental ethics among rock climbers, we conducted a factor analysis of the scale items which yielded three factors of interest: 1) A Practical, Weak Non-Anthropocentric, Environmental Ethic, 2) A Metaphysical, Holistic Environmental Ethic, and 3) A Religiously-Inspired, Soft-Anthropocentric Environmental Ethic. The results of non-parametric analyses (Mann-Whitney U) showed that climbing differences based on both mode of introduction to the sport and current climbing styles revealed differences in environmental ethics.

ENVIRONMENTAL ETHICS: THEORETICAL AND EMPIRICAL BACKGROUND

Environmental ethics, as a stand-alone field of inquiry, has a relatively short history. Many people point to the quizzically titled address given by Richard Sylvan at the Fifteenth World Congress of Philosophy in Bulgaria in 1973 as one convenient starting point. Sylvan (1998) asked if there was “a need for a new, an environmental, ethic” to guide our commitments towards an increasingly complex relationship with non-human nature. And John Passmore in 1974 authored the first book-length treatment of environmental ethics by a philosopher. Certainly there were pleas made previously for a more enlightened view of the environment: Rachel Carson’s *Silent Spring*, Aldo Leopold’s *A Sand County Almanac*, and tracing back further to the writings of Muir, Marsh, Thoreau, and Emerson. Each of these individuals attempted to cast doubt on traditional utilitarian analyses of natural resources. However, the field of environmental ethics really didn’t come into its own until the early to mid-1970’s. Since that time a number of contemporary authors and philosophers have explored the boundaries of the field and wrestled with a number of theoretical and applied problems.

Holmes Rolston III (1988), J. Baird Callicott (1980; 1987; 1989) and others have staked out assorted forms of ecocentric ethics. Peter Singer (1998a; 1998b) and Tom Regan (1985; 1996) and Paul Taylor (1998) have explored competing versions of individually-based ethics. And others still are charting out broader environmental philosophies, such as Devall and Sessions’ (1985) Deep Ecology, Murray Bookchin’s (1988) Social Ecology, and Karen Warren’s (1998) Ecofeminism to name a few. Lastly a current debate within the field attempts to reconcile the elegance of a monist environmental ethic with the practicality of a pluralistic approach (Norton 1995). The result of all of this work is a wide array of philosophical premises, ethical theories, and

moral communities. Despite the wide ranging efforts and the deep, critical thinking behind these ideas, little in the way of empirical testing has been done.

In the past 30 years, a mere handful of researchers have attempted any sort of studies that measure environmental ethics. Minteer and Manning (1999) noted as much when they commented, “empirical research [on] ‘environmental ethics’ is largely absent from the scholarly literature” (p. 195). Indeed, aside from Minteer and Manning’s study, the authors of this paper can attest to only five other empirically-based environmental ethics studies conducted over the past few decades (Allen and Ferrand, 1999; Dunlap & Heffernan; 1975; Kahn, 1999; Swearingen, 1989; and Szagun and Mesenholl, 1993). The topic of environmental ethics is distinct from environmental attitudes or environmental values. One’s environmental values may inform one’s environmental attitudes. And environmental attitudes may be further reflected in an environmental ethic. But the defining characteristic of an environmental ethic is its cohesiveness and consistency of thought. Any ethic, environmental or otherwise, should be able to respond clearly to a number of questions. In fact, it is the range of responses to these questions, which collectively describe the full scope of environmental ethics as seen today.

The background of environmental ethics literature led to the creation of the Minteer and Manning scale. Specifically, those researchers “devised a typology of potential environmental ethics, informed by a number of sources in the philosophical and historical literature” (p. 197). The development of their scale draws from arguments found in works by several of the environmental philosophers listed previously (e.g., Passmore, Singer, Regan, Rolston, Callicott, and Norton). Specifically, Minteer and Manning attempted to study environmental ethics by administering a questionnaire that

contained statements representative of several established environmental ethics positions. It was our purpose to test this scale on a specific cohort of outdoor recreationists: rock climbers in the Adirondacks. Our decision to study environmental ethics from a sample of rock climbers was driven by our knowledge of these participants through previous research and personal experiences.

ROCK CLIMBING: PARTICIPANTS, MOTIVATIONS, AND TRAINING

Over the last twenty years the sport of rock climbing has seen steady growth in participation (Freischlag and Freischlag, 1993). The proliferation of indoor climbing facilities has brought synthetic rock climbing environments to millions of people who otherwise may not have had the resources to participate in rock climbing. Many indoor climbing centers provide outdoor climbing opportunities as part of their programming and thus, more people are taking rock climbing participation outdoors to climb on natural surfaces.

Like other outdoor recreation pursuits, rock climbing participation has an environmental impact. Introductory rock climbing experiences are important in discerning how perceptions of environmental responsibility while climbing are developed. As participation in rock climbing grows, so does the demand for more and more climbing areas. And as climbing areas are developed, how climbers perceive and care for the environment will be of interest to land managers and climbers alike. In order to better understand the environmental ethics of rock climbers, it is helpful to examine their motivations to participate in the sport. For example, are they participating in order to impress friends or to experience a connection with the natural environment?

Determining what motivates a person to participate in so-called adventurous activities has received much research attention (Celsi, et al., 1993; Ewert and Hollenhorst, 1989; McIntyre, 1992). Celsi and others (1993) highlighted extrinsic pressures such as social demands as one form of motivation. Specifically, they identified such motivations as the desire to be a part of a group and the yearning to feel respected in social environments. Among a sample of skydivers, Celsi and others (1993) recognized this phenomenon that led to the development of a community guides social norms.

Ewert and Hollenhorst (1989) and McIntyre (1992) determined that as skill, participation and the perceived importance of the activity increase, the effectiveness of external pressures as motivators decreases. Instead, motivations shift towards being intrinsic. Intrinsic motivations include pushing one's self, increasing self-efficacy, and feeling the thrill of participation (Celsi et al., 1993). Instead of participation for the need to be a part of a social group or gain respect, participation becomes more inwardly motivated—more about the quality of the experience and the environment in which the activity takes place. Additionally, the process of recreation specialization occurs in which participants become more selective and more internally motivated the longer they stay with an activity. This tension between external, social motivations and internal rewards has some bearing on the rapid increase in rock climbing. Hobson Bryan (2000) noted that recreationists who are quickly drawn into a sport “may develop technical proficiency long before acquiring ethical standards to guide their conduct” (p. 20). Further, the rise of synthetic climbing areas can facilitate this technical proficiency without the attendant cost of learning about environmental consequences.

Training in the rock climbing discipline has taken on two major forms in recent years: recreational and professional. Recreational climbers have literally thousands of options regarding training, which range from private climbing companies offering training or larger entities such as Eastern Mountain Sports (EMS) or the National Outdoor Leadership School. For those who have made climbing a profession in the United States, the American Mountain Guide Association (AMGA) is the current standard for professional training. The AMGA is a non-profit organization that seeks to represent the interest of American mountain guides by providing support, education, and standards. The American Mountain Guides Association and Eastern Mountain Sports advertise that their training includes a consideration for the natural environment. Indeed, these organizations do attempt to teach a form of environmental ethics, through their professional codes of conduct, that promotes respect for the natural world.

However, these codes of professional conduct are really only thin expressions of environmental ethics. These expressions reference a general notion of respect for the natural world yet they do not advocate a cohesive, philosophically-based system of logical thought nor do they expressly identify any discrete moral community or ethical theory to guide one's decisions. For example, NOLS an original partner in the "Leave No Trace" program, offers what they term instruction in "an outdoor ethic" that encourages outdoor recreationists to minimize their impacts to the natural environment. Yet, the prescriptions for appropriate behavior do not suggest a comprehensive environmental ethic. Rather, they suggest a list of dos and don'ts that are as much guided by considerations of safety, maintaining quality recreational opportunities, and minimizing the need for heavy-handed management as they are designed to protect

wildlife, plants, waterways, and ecosystems due to their membership(s) in specific moral communities. The environmental ethics scale questions used in this study specifically demand an accounting of moral communities and ethical theories.

In addition to the many formalized training avenues mentioned above, many novice rock climbers become introduced to the sport through rather informal means—they go rock climbing with friends or family members without the guidance or purview of professional outfitters or organizations who train recreational and professional climbers. And at least one study found significant differences in how the formal and informal training methods resulted in different approaches to following low-impact recommendations (Harding et al. 2000). These researchers found that mentoring and apprenticeship in the climbing community in western Montana played a role in the development of a climbing ethic that stressed adherence to low-impact recommendations.

The result of the demographic, motivation, and training data on rock climbers led the researchers of this study to consider how some of these independent variables might correspond to the dependent environmental ethics variables. Specifically, the researchers considered how one's introduction to the sport, preferred practice of the sport and motivations of participation relate to one's environmental ethics.

METHODOLOGY

Development of the survey instrument was guided by previous research on rock climbing and rock climbers (Borrie and Harding, 2002) and a recent empirical treatment of environmental ethics (Minteer and Manning, 1999). The result was a 35-question survey covering demographic information, motivations, methods of introduction to the

sport, and seventeen dimensions on an environmental ethics scale. The questionnaire was administered over four days at two sites in the Adirondacks in upstate New York during the fall of 2004. Eighty climbers were approached, four declined to participate and six filled out incomplete or unusable surveys for final sample size of seventy.

The previous research on rock climbing and rock climbers (Borrie and Harding, 2002) concluded that rock climbers express a diverse range of environmental ethics commitments and moral communities. Minter and Manning (1999) developed an environmental ethics scale that specifically addressed different ethical theories and moral communities. Finally, the selection of the Keene Valley area in the High Peaks region of the Adirondacks represented a convenient (i.e., local) venue which is a destination for rock climbing in the northeast.

Subjects were screened for appropriate age (climbers had to be at least 16 years old) and then informed of the nature of the research. There was no premium or incentive given to entice subjects' participation. After agreeing to participate, each subject was given a clipboard with the 35-question survey. Subjects completed the survey in approximately 5-10 minutes and questionnaires were collected on-site.

Condensing the relationships between the dependent and independent variables yields five testable null hypotheses:

Ho1: Climbers introduced to the sport by more formalized methods will have no different environmental ethic than climbers who were introduced to the sport by more informal methods.

Ho2: Climbers who were introduced to the sport indoors will have no different environmental ethic than climbers who were introduced to the sport outdoors.

Ho3: Climbers motivated by physical fitness and skill development will have no different environmental ethic than climbers who are motivated less by physical fitness and skill development.

Ho4: Climbers who feel positively about fixed gear (permanently placed bolts/anchors) will have no different environmental ethic than climbers who feel negatively about fixed gear.

Ho5: Climbers who spend most of their time climbing in natural areas will have no different environmental ethic than climbers who spend most of their time on synthetic walls.

The independent variables of interest (method and mode of introduction to the sport, motivations for participating, feelings about fixed gear, and predominant climbing style) were listed among other demographic and participation sorts of questions on the survey instrument. The dependent variable, environmental ethics, was derived from reducing the seventeen items on the environmental ethics survey developed by Minteer and Manning to three unique factors from a factor analysis statistical technique.

Survey results were entered into an SPSS (version 10.0) data file and screened for obvious data entry mistakes using frequencies. Following this, descriptive analyses were run on the demographic questions and the independent variables. Finally, the 17 item environmental ethics scale (dependent variables) was run through an exploratory factor analysis (Principle Component Analysis) with Varimax rotation. Two questionnaire items were eliminated due to weak loading, resulting in a final factor analysis of 15 items yielding a three factor solution (Table I).

Rotated Component Matrix^a

	Component		
	1	2	3
Nature will be important for future generations.	.936		
Nature adds to the quality of our lives (for example, outdoor recreation, natural beauty).	.918		
The supply of goods and services provided by nature is limited.	.896		
Human survival depends upon nature and natural processes.	.825	.234	
All living things are interconnected.	.778	.229	
Animals should be free from needless pain and suffering.	.710		-.238
Because humans can think, they are more important than the rest of nature.	-.640	-.410	.324
All living things have a moral right to exist.	.568	.412	
Cruelty towards animals makes people less human.	.454	.435	
All living things have a spirit.		.767	
Nature is a storehouse of raw materials that should be used by humans as needed.		-.729	.324
All living things are sacred.	.432	.615	.351
Humans have a religious responsibility to take care of nature.			.839
Nature is God's creation.			.773
Humans were created as more important than the rest of nature.	-.447	-.319	.644

Extraction Method: Principal Component Analysis.
 Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 5 iterations.

Table I: Three factor solution from Principal Component Analysis with Varimax Rotation.

RESULTS

Descriptive statistics were run on the demographic variables. Approximately 2/3 of the sample (64.9%) was male. Nearly half (49.3%) of those surveyed had only been climbing for three years or less; the average length of time climbing was 6.35 years. About three-quarters of those surveyed (72.6%) had completed high school.

An exploratory factor analysis was used to identify the important dimensions of environmental ethics. The three factors that emerged were: 1) A Practical, Weak Non-Anthropocentric, Environmental Ethic, 2) A Metaphysical Holistic Environmental Ethic, and 3) A Religiously-Inspired Soft Anthropocentric Environmental Ethic. These three factors were then used as dependent variables in assorted analyses devoted to different aspects of a climber's history and his/her preferences. Significant differences were found among different types of rock climbers and moderate support can be given to the environmental ethics scale.

Factor analysis as a statistical method is a data reduction technique whereby a large number of variables are reduced to a smaller number of variables (eigenvectors or factors). This reduction is made possible through a series of correlational and variance based analyses. In brief, exploratory factor analysis "essentially decomposes a correlation matrix into its constituent factors" (Bryant and Yarnold, 1995, p. 107). In this analysis, the fifteen environmental ethics questionnaire items were reduced to three factors. These factors represent common responses to scale items. For instance, those who tended to agree strongly with the statement "Humans have a religious responsibility to take care of nature" also tended to agree strongly that "Humans were created as more important than the rest of nature". The combined correlation of these two statements

(with five others) resulted a factor which would be labeled, The Religiously-Inspired Soft Anthropocentric Environmental Ethic. See Table I for the loading of each scale item and how they relate to each factor. The naming scheme of the factors represents the summarizing of correlated variables within a factor to a unique expression which conveys the meaning of the factor.

The three factors are described more fully here. A Practical, Weak Non-Anthropocentric, Environmental Ethic rejects a universal view of human supremacy. Humans are not considered privileged, special, or morally more valuable than any other species. This ethics also proposes that non-human animals have a moral right to exist and that it is morally wrong to harm non-human animals—essentially a zoocentric ethics. However, this ethics does not dispute that nature also has utility value for humans and that humans can and should use the environment to meet our needs. Indeed, humans are definitively resource users and our environmental ethic should allow us to continue to use the earth's resources for our benefit so long as we do not violate the rights of non-human animals to their existence and well-being. As a result, this ethic is neither purely zoocentric, nor wholly anthropocentrically utilitarian. It is, indeed, something of a blending of the two—practical and weakly non-anthropocentric due to the recognition of the role that the natural world plays in human well-being, yet decidedly in favor of the rights and welfare of non-human animals.

The Metaphysical, Holistic, Environmental Ethic rejects any notions of human supremacy as well as most human-based justifications for resource use. To this end, this is the most non-anthropocentric of the three factors—humans are neither special among all living things, nor are we entitled to use the earth's resources for our exclusive benefit;

yet we recognize that human survival is deeply dependent upon nature and natural processes. This ethics subscribes to the belief in a sacred interconnectedness of all living things and that cruel human interactions with non-human animals lessen our humanity. There is a web of life that is of greater importance than any individual part. However, this ethic also promotes a view that all living things have a moral right to exist. To this end, this is not a purely ecocentric ethic either.

The Religiously-Inspired, Soft Anthropocentric, Environmental Ethic subscribes to a form of human supremacy. In this view, humans are considered to be special among all other life forms. Further, God's goodness is evidenced through the wonder of the natural world; in fact undeveloped areas actually reveal the presence and beneficence of the Divine. And this ethic suggests that humans are divinely mandated caretakers (stewards) of the environment; and we are free to use nature's storehouse of raw materials as needed. One who subscribes to this ethic believes that God has given the earth to humanity and it is incumbent upon us to care for the natural world in a thoughtful and caring manner, yet the suffering of animals is not considered morally objectionable.

As a result of these three 'types' of environmental ethics, we were able to consider environmental ethics as spanning three different dimensions rather than multiple questionnaire items. Further we were able to consider how complex interactions of environmental ethics commitments interact and correlate with one another. To this end, multiple questionnaire items were collapsed into the three factors revealing more complicated expressions of environmental ethics than simple, pure forms of anthropocentrism, zoocentrism, and ecocentrism.

Our first hypothesis considered differing environmental ethics based on the method of introduction to the sport of rock climbing. Previous research into rock climbing ethics (Borrie and Harding 2002) suggested that individuals who are brought into the sport through formal, structured classes will develop a different environmental ethics than those who are introduced to the sport through informal means. Due to the relatively small sample size and heterogeneity of the subject's environmental ethics, all of our statistical analyses were conducted using nonparametric tests. The Mann-Whitney U test was used to determine if the environmental ethics of those introduced to rock climbing through formal methods differed from those introduced through informal methods. The results of this analysis can be found in Table II.

	A Practical, Weak Non-Anthropocentric, Environmental Ethics	A Metaphysical Holistic Environmental Ethics	A Religiously Inspired, Soft Anthropocentric, Environmental Ethics
Mann-Whitney U	314.000	336.000	350.000
Wilcoxon W	467.000	489.000	1296.000
Z	-.845	-.484	-.254
Asymp. Sig. (2-tailed)	.398	.628	.799

Table II: Analysis of formal versus informal mode of introduction to the sport of rock climbing.

There was no significant difference found across any of the environmental ethics factors. In other words, whether climbers were introduced to the sport formally or informally had no relationship to their environmental ethics.

The second hypothesis reconfigured the idea of introduction to the sport and focused on the medium in which a climber was introduced to the sport. Specifically, we

considered whether a climber was introduced to the sport indoors or outdoors would have some bearing on his/her environmental ethics. The results of this analysis can be found in Table III.

	A Practical, Weak Non-Anthropocentric, Environmental Ethics	A Metaphysical Holistic Environmental Ethics	A Religiously Inspired, Soft Anthropocentric, Environmental Ethics
Mann-Whitney U	383.000	390.000	256.000
Wilcoxon W	1244.000	1251.000	487.000
Z	-.707	-.602	-2.595
Asymp. Sig. (2-tailed)	.480	.547	.009

Table III: Analysis of indoor versus outdoor method of introduction to the sport of rock climbing.

This analysis did yield a significant result. The factor of A Religiously-Inspired, Soft Anthropocentric, Environmental Ethic was different depending on the medium of introduction. Climbers who were introduced to the sport indoors tended to express a greater degree of A Religiously-Inspired, Soft Anthropocentric, Environmental Ethic. Specifically, indoor-introduced climbers were more likely to believe that humans are especially unique among all species and that we are divinely appointed stewards of the earth. They also believe that nature is evidence of God’s creation. Those climbers introduced to the sport outdoors tended to disagree with the core components of a religiously-inspired, soft anthropocentric, environmental ethics.

Our third hypothesis focused on the motivations of rock climbers. We addressed the specific motivations dealing with the physical aspect of climbing as opposed to spiritual motivations, social motivations, or some other category of motivation. The

degree to which a climber expressed stronger motivations surrounding physical aspects of the sport (physical challenge, fitness, and testing one’s skills) was proposed to explain a difference in environmental ethics. The results of this analysis can be found in Table IV.

	A Practical, Weak Non-Anthropocentric, Environmental Ethics	A Metaphysical Holistic Environmental Ethics	A Religiously Inspired, Soft Anthropocentric, Environmental Ethics
Mann-Whitney U	281.000	405.000	451.000
Wilcoxon W	947.000	756.000	1117.000
Z	-2.668	-.899	-.243
Asymp. Sig. (2-tailed)	.008	.369	.808

Table IV: Analysis of physical versus non-physical motivations for engaging in rock climbing.

We rejected the null hypothesis in this analysis. In particular, the factor of A Practical, Weak Non-Anthropocentric, Environmental Ethic differed depending on whether someone was more committed to the physical aspects of rock climbing. Those climbers who were more motivated by the physical aspects of the sport were more likely to express A Practical, Weak Non-Anthropocentric, Environmental Ethic. Specifically, they tended to reject notions of human supremacy. They also felt that non-human animals have a moral right to exist. Yet, these physically-motivated climbers were more likely to acknowledge that humans can and should use the natural environment to meet our needs. This would seem to correspond to the motivation in question—rock climbers who use the resource as a vehicle of sorts to test their skill or to exercise would seem to endorse at least some degree of a utilitarian view of the resource.

The fourth hypothesis considered a climber's feelings towards fixed gear. The belief was that climbers who feel positively about fixed gear would express a different environmental ethic than climbers who feel negatively about fixed gear. The results of this analysis can be seen in Table V.

	A Practical, Weak Non-Anthropocentric, Environmental Ethics	A Metaphysical Holistic Environmental Ethics	A Religiously Inspired, Soft Anthropocentric, Environmental Ethics
Mann-Whitney U	337.000	299.000	350.000
Wilcoxon W	898.000	705.000	911.000
Z	-1.809	-2.359	-1.621
Asymp. Sig. (2-tailed)	.070	.018	.105

Table V: Analysis of positive feelings versus negative feelings towards fixed gear.

A significant difference was found in this analysis. Climbers who expressed more negative feelings towards the use of fixed gear were more likely to express a greater degree of A Metaphysical Holistic Environmental Ethic. Specifically, this group of climbers strongly rejected notions of human supremacy and human-based justifications for resource use. Climbers feeling negative about the use of fixed gear also felt that all living things are connected and that they likely have a spirit. These climbers felt negatively about modifying a rock face for the well-being of humans and they were more likely to express the belief that the earth is not ours to use exclusively.

The final hypothesis examined the predominant climbing that climbers currently engage in: on natural rock or on a synthetic environment. The suspicion was that the predominant climbing style would be indicative of a differing environmental ethic. This analysis can be found in Table VI.

	A Practical, Weak Non-Anthropocentric, Environmental Ethics	A Metaphysical Holistic Environmental Ethics	A Religiously Inspired, Soft Anthropocentric, Environmental Ethics
Mann-Whitney U	355.000	374.000	474.000
Wilcoxon W	790.000	809.000	1035.000
Z	-1.742	-1.474	-.063
Asymp. Sig. (2-tailed)	.081	.140	.949

Table VI: Analysis of predominantly climbing on synthetic versus natural areas.

No significant difference was found across any of the three environmental ethics factors with regards to the predominance of climbing on a natural area or on a synthetic area. In other words, climbers who spend most of their time climbing in natural areas express no different environmental ethic than climbers who spend most of their time climbing in synthetic areas.

CONCLUSIONS: LIMITATIONS AND IMPLICATIONS

This research presented a novel approach to quantitatively evaluating assorted environmental ethics positions. The factor analysis method was similarly unique with regards to a statistical analysis method. The small sample size represents one limitation of the study. Yet, there is not a single mathematical guideline for factor analysis sample size and one factor analysis source book (Lawley and Maxwell, 1971) suggests simply that the sample size should be at least 51 cases greater than the number of variables.

Another limitation of the current research deals with the breadth of the environmental ethical theories represented in the survey instrument. Notably absent from the survey were questions that could have addressed other dimensions in the field of environmental ethics. In particular, Karen Warren's (1998) well-known treatise on an

ecofeminist approach to rock climbing would seem particularly helpful in guiding research questions. Similarly, other under-represented environmental ethics approaches such as a teleologically-based ecocentric ethics, a virtue ethics, care ethics, and more recent developments in pragmatism would seem to offer further refinement in the measurement of environmental ethics. These then represent possible avenues for future research in order to achieve a more thorough treatment of the topic.

An additional limitation of the study rests with the demographics of the sample. Males outnumbered females by about 2 to 1. Given the findings of Carol Gilligan (1982) in her work on moral development. There may be some reason to suspect that females would express a different form of environmental ethics than males. Secondly, this sample was rather youthful, in terms of years climbing. The median number of years spent climbing was just four. Also related to the moral development literature of Gilligan (1982) and Kohlberg (1971), there may be some reason to suspect that climbers who have been in the sport for multiple years possess a different environmental ethics. Mann Whitney U tests did not find any statistically significant differences in environmental ethics based on either gender or years climbing. However, this may be another line of research of interest.

Noteworthy among the findings are three of the analyses—two with significant findings and one without. In the first analysis (Hypothesis 1), climbers expressed no distinctly different environmental ethic based on being introduced to the sport formally or informally. Preliminary research in a previous study (Harding and Borrie 2000) suggested that this would be a critical factor. Specifically, multiple stakeholders interviewed in that study made explicit notations that climbers who apprentice with a

knowledgeable friend or family member tend to develop a more cohesive environmental ethic than those who learn the sport from a formal group/organization that emphasizes skills rather than ethics. We did not find evidence to support this through our study.

Hypothesis 2 proposed that those climbers introduced to the sport indoors would have no different environmental ethic than those introduced outdoors. We rejected this hypothesis, finding instead that climbers introduced indoors tended to express a more Religiously-Inspired, Soft Anthropocentric Environmental Ethic than climbers who were introduced to the sport outdoors ($p = .009$). The indoor-introduced climbers tended to believe that humans are divinely special and God-appointed caretakers of our natural resources. It follows that these climbers would be more responsive to anthropocentrically-worded arguments regarding resource damage or route closures. Conversely, those who were introduced to the sport outdoors would tend not to be as responsive to these arguments, preferring perhaps, less anthropocentric rationales.

In testing Hypothesis 4, we proposed that those climbers with positive feelings about the use of fixed gear would have no different environmental ethic than climbers with negative feelings about the use of fixed gear. We found that climbers who felt more negatively about the use of fixed gear were more likely to subscribe to A Metaphysical Holistic Environmental Ethic ($p = .018$). This form of environmental ethic is more closely aligned with the current core of environmental ethics discourse—firmly ecocentric, rooted in the sciences of ecology and evolutionary biology. A concern here is that certain types of climbers (those who tend to eschew fixed gear) may understand and respond better to arguments over route closures or climbing restrictions that are rooted in ecological issues. Specifically, raptor nesting seasons, in particular those of the peregrine

falcon, often drive the seasonal closures of rock climbing areas. Rock climbers who felt negatively about the use of fixed gear and expressed a more Metaphysical Holistic Environmental Ethic would tend to understand and appreciate the justification for this closure than would rock climbers who felt favorably about the use of fixed gear and who did not express such a high degree of an ecocentric environmental ethic. In this instance, resource managers should be prepared with additional justifications rooted in less ecocentric reasoning.

The implications of this research extend to the management of outdoor climbing areas and the educational techniques used in teaching climbing indoors. Specifically, rock climbers constitute a diverse group, differing in motivations, levels of skill, preference for climbing styles (traditional vs. sport), and how they were introduced to the sport. The resource impacts to natural areas resulting from recreation use are well documented. In particular, rock climbers have themselves been the focus of some resource impact research. To the extent that resource impacts may, in part, be determined by the flavor or degree of one's environmental ethic, encouraging land managers to understand the different environmental ethics of climbers may go some ways towards better preparing climbers to consider their impact on the resource.

Additionally, the development of an environmental ethic is often embedded in the introduction to and continued practice of the sport. Specifically, hunters, anglers, and snowmobilers tend to develop their environmental ethics from the earliest engagements with their sport. Rock climbers introduced to the sport outdoors express a different sort of environmental ethic from the environmental ethics developed by indoor-introduced

climbers. Yet, climbing skills and techniques are often readily transferred from the climbing gym to natural rock, sometimes in the absence of any environmental ethics.

From the philosophical end the discussion, this study also reveals the merit of continuing the discourse on the monism-pluralism debate. The findings of this research illustrate that expressions of environmental ethics sometimes come packaged together in combinations of ethical commitments. When the factor analysis revealed that some rock climbers advocate A Practical, Weak Non-Anthropocentric, Environmental Ethic, their position acknowledges the utilitarian use of environmental resources for human benefit and the moral rights that all living things have to exist. To this end, work remains to be done on how to reconcile these seemingly contradictory positions. We propose that a more detailed environmental ethics scale be developed—one that includes a fuller range of ethical theories (utilitarianism, deontology, natural law, virtue, and care) and a more explicit accounting of moral communities (humans vs. sentient creatures vs. living things, vs. species vs. ecosystems, etc.).

Finally, rock climbing is an extraordinarily diverse sport with many different types of climbers and climbing styles. Our research on rock climbers in Keene Valley in the Adirondacks captured but a small portion of the overall climbing community. There are many distinctions even within the bifurcated categories we studied. For example, even within a ‘fixed gear’ category this might refer to using fixed gear on lead, on rappel, or on both. Further, there may be specific climbing ethics localized to a particular area. Yet, even within this geographically discrete region in which a small sample of climbers was surveyed a wide diversity of environmental ethics were described.

The authors conclude by suggesting that land managers, climbing instructors, and climbing manual authors take steps to develop a range of environmental ethics messages to speak to the different types of environmental ethics. And further we propose that indoor climbing instruction include particular lessons or guidance on environmental ethics. Lastly, these environmental ethics messages should acknowledge that some climbers may respond better to Practical, Weak Non-Anthropocentric arguments, others may respond more favorably to Metaphysical Holistic arguments, and others still may respond better to Religiously-Inspired Soft Anthropocentric ethical defenses.

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