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THE EFFECT OF THE ORION PROGRAM ON ENVIRONMENTAL ATTITUDES

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ABSTRACT

The Penn State ORION program is a wilderness orientation experience for incoming freshmen to the University. A review of the relevant literature and previous personal knowledge of the course showed two of the primary goals to be: 1) increased environmental awareness and 2) the building of social relationships. The purpose of this study was to examine the effectiveness of the ORION program with regards to these two goals, with focus on the environmental aspects. This was done using an online pre-test/post-test approach that had participants take similar surveys before and after their ORION experience. Despite a large number of questionnaires submitted, there was little overlap between students who chose to take both the first and second surveys. Thus, analysis across groups proved to be impractical. In taking individual group results, most tests were found to have little or no relationship, with a few exceptions. Males were much more likely to have previously participated in outdoor activities before entering the ORION program, and students overall expressed that their primary reason for choosing to do ORION was meeting new people and making friends. Further research and a survey design that is more successful capturing pre- and post-test results from the same individuals is needed if conclusive results are to be discovered.

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Chapter 1

Introduction

The ORION Wilderness Orientation Program (from now on referred to as ORION) is a six day course for incoming freshmen operated by Shaver's Creek Environmental Center (SCEC), an educational arm of Penn State Outreach. The primary purpose of ORION is to help students transition from home to college through the development of friendships within a small group setting. The wilderness setting in which the course is taught provides a space for students to get out of their comfort zone relatively quickly. Additionally, ORION serves as hands-on learning for students to gain an increased knowledge and understanding of environmental issues related to camping and the world at large.

Student participation in ORION is voluntary. After students accept their offer of enrollment from Penn State, they are sent a brochure detailing ORION. Aside from being an orientation program, ORION is also a two credit kinesiology course that appears on students' fall semester schedule (despite the majority of the instruction occurring in the summer) and can be counted toward their general education requirements for a bachelors degree. In the summer of 2009, there were four sessions offered: two in late July and two in late August (the two weeks immediately preceding the start of classes). The total cost for the program in 2009 was \$195, which included all meals, transportation within the bounds of the experience, and gear rental for the duration of the trip. The maximum capacity for each summer is 240 students (4 sessions of 60 each), and in the summer of 2009 there were approximately 220 students that participated in the program.

Specifics of the Trip

Upon arrival at the Penn State campus, students congregate in a large group and play “ice-breaker” games designed to facilitate interaction between their fellow participants. Leaders also participate and provide enthusiasm during the ice-breakers. After a number of these games, students are broken up into smaller groups (10-12, assigned randomly) and are introduced to two leaders (one male, one female) with whom they will spend the balance of the trip. Equipment including a backpack, sleeping bag and various group gear is distributed and the rules of the program (e.g., shoes at all times, no drugs and alcohol) are explained to the participants. Soon thereafter, the groups depart for a number of different starting locations for their backpacking trips, primarily in the Rothrock State Forest or the Moshannon State Forest, both of which are located within an hour’s drive of the Penn State University Park campus.

Throughout the 6-day trip, participants are instructed in backcountry skills (e.g., pitching and striking tents and tarps, using bear bags, camp cooking); backcountry ethics, specifically the Leave No Trace principles (Leave No Trace, 2008); and proper environmentally-conscious behavior. Participants are also given general orientation information for Penn State, such as what to expect during the first few weeks of life on campus, and tips and tricks (best places to eat, where to study, etc) from older students.

Once the students have completed their backpacking portion of the trip, they have the opportunity to participate in one of two “additional adventures”. Some will go canoeing on the Bald Eagle Creek, a short drive from Penn State’s campus while others will use the high ropes course at Stone Valley Recreation Area, located within 700 acres

of varied eco-systems owned and managed by Penn State. These activities are chosen based on the pick-up point of each group. In general, those groups that hiked the Allegheny Front Trail in Moshannon State Forest will go canoeing, while those that were in Rothrock State Forest will climb the high ropes course at Stone Valley. When these adventures are finished, each group returns to Shaver's Creek Environmental Center, and a picnic dinner is held for all of the participants in the program. The final morning sees participants cleaning their rental gear and leaving for home or to move into the dorms.

Research Question

The purpose of this study was to determine the effect of ORION on student's environmental attitudes and expected behavior. Leave No Trace and common environmental stewardship are major themes of the Program, and this study attempted to establish whether there is a relationship between the curriculum and a change in student's attitudes. Aside from general environmental values questions, specific Leave No Trace aspects were also measured. Additionally, determining why students chose to participate in the program was an important component of the study. Finally, the impact of the program on participants both in the educational and social context was explored.

Chapter 2

Literature Review

Adventure programs are used all over the world as an alternative to traditional classes as well as recreational opportunities for students and adults. While each program has its own activities and nuances, there are a variety of different features that tend to remain similar across programs. According to substantial research, these programs have the potential to produce the same effects. In general, outdoor and adventure activities increase environmentally conscious attitudes and behaviors (Atkinson, 1990) while also developing the social skills and behaviors of the participants involved (Mason, 2005). These goals are realized through a variety of program related mechanisms, including the curriculum itself, the relationships with leaders, and journaling or writing throughout the program (Attarian, 1996).

In spending a large amount of time in the wilderness or just simply in the outdoors, it would be logical to conclude that there would follow a greater appreciation for the natural world. An increase in environmentally conscious behaviors or attitudes is one of the most notable possible effects of an outdoor adventure program, and although it is not consistently found in every situation, preliminary research has shown that there may in fact be a correlation. In a non-education context, George Atkinson (1990) notes that “those leisure activities which focus on appreciating the natural surroundings seem to have more of an impact on one’s environmental concern and likelihood to act in a pro-environmental manner” (p. 2). In their study of elementary school children, Palmberg

and Kuru (2000) concluded that “experiences in outdoor activities offer great possibilities for the development of a strong empathetic relationship with nature” (p. 36). In this case, the primary concern of the education program was environmental values and learning, but the recognition that outdoor activities will help further this goal is an important step in determining the value of adventure programming to helping teach students about the natural world. Indeed, some research has shown that a lack of outdoor activities and an increased reliance on traditional environmental education can be detrimental to the overall program goals. Glyn Thomas (2005), paraphrasing Peter Martin’s (2004) work, says that “without the challenge and fun which accompanied these adventure experiences in the natural environment, it is possible that the desire to develop connections with places would be reduced” (p. 33). It is clear that adventure aspects of environmental education are important to the development of an effective program.

Another important effect of adventure programs is social development, an often stated program goal. Building relationships between peers is commonly a result of many outdoor adventure programs. Removing participants from familiar settings and forcing them to step outside their comfort zone is thought to provide a more intense environment in which to build social relationships. In a country-wide survey of outdoor orientation programs, Berman and Berman (1996) found that the most common reason universities utilized these types of courses was because “the wilderness represented a foreign and unique type of environment” and that development was “especially applicable when students were pushed out of their comfort zone” (p. 26). Individuals responsible for Penn State’s ORION program declare that it will “foster your personal growth, increase your confidence, and bolster your self-esteem” as well as allow you to “meet other incoming

students and form solid friendships” (SCEC, 2006). Program-specific examples of this social development are readily available. For example, in 2005 Mason studied the ORION program and its effect on the social development of participants. Mason found that students felt “the location and environment of the program was an important factor in their decision to take part”, and that “being in the wilderness was such a critical part of their alternative orientation experience” (p. 74). In building relationships, he found that participants “overwhelmingly responded that the most influential part of their ORION...experience was meeting and befriending others who were in the same situation as themselves” (p. 71). Based on this evidence Mason concluded that the ORION program “may have a positive effect on how comfortable participants are with the idea of incorporation into university life” (p. 72).

Getting to environmental and social benefits such as increased awareness and the building of friendships requires an analysis of the methods used within the adventure programs themselves. A variety of different mechanisms have been proposed as the driving force behind the effectiveness of programs like ORION. Atkinson (1990) notes that “we form our adult attitudes about the natural environment based on our formative experiences in the outdoor world”, and that “if we see the natural world...as a place...where we had pleasant experiences, we are more likely to vote, act, and generally support the natural world more forcefully” (p. 2). This is not an underlying goal or mechanism of ORION, but the program itself has the potential to build environmental attitudes simply based on the outdoor nature of the experience. More to the point, leaders can orchestrate the curriculum to better reflect environmental values and through their role as a leader impact participants experience, but in the end it is the participant’s

personal experience that will dictate the resulting attitudes. Perhaps the most important thing that leaders can do with regard to molding the attitudes of their participants is role modeling. Aram Attarian (1996) says that “role modeling has been shown to be an effective way of changing resource use behavior, especially in river environments, campgrounds and backpacking areas” (p. 41). In many situations where the leaders are older than the participants (such as camp counselors), they are looked up to and their behavior is mimicked, which is why Attarian stresses that “the instructor should model the appropriate behavior and techniques” (p. 42). Leaders clearly can have an impact on the experience and values of their participants, not only within the constraints of the program but also through their own personal actions, serving as a role model for those around them. Finally, one of the more unique and less common methods that is used to develop environmental and social behaviors in outdoor and adventure programs is the concept of journaling, or writing thoughts during and after the program.

Journaling has become a part of many wilderness and outdoor education programs as a way for students to reflect on what they have done throughout the day and where they will continue to go as the program progresses. While verbal discussion is somewhat effective in this respect, allowing students time to process and write down their thoughts will often help to solidify the teachings of the day. Preston (2004) found that “journal entries also attest to the positive influence of the experiences in developing connections with natural places” (p. 18). They also provide an opportunity for instructors to evaluate the effectiveness of their teaching as well as for students to review their knowledge. More importantly, journaling may reinforce things that participants have learned

throughout the day. Attarian (1996) describes the following benefits of a regularly kept journal:

Writing can be very helpful in clarifying ideas, reaching decisions, dealing with obstacles, or reinforcing attitudes and behaviors. The journal can also be used to record activities and events, describe people, and explore perceptions (p. 44).

While a journal is certainly not necessary in order to shape environmental or social attitudes, its effective utilization can greatly enhance the experience for participants and the development of an effective program.

Psychometric scales have also been developed to assess environmental attitudes. For example, The New Environmental Paradigm developed by Riley Dunlap has been the standard scale used to measure environmental attitudes since 1976. In the early 1970s, there was a growing concern regarding environmental issues, as evidenced by their prominent position in the national policy agenda (Dunlap, Van Liere, Mertig and Jones, 2000, p. 425). These were primarily issues that dealt with national economic or health implications (e.g., energy, air pollution), but the tide was shifting to a more individualistic view of the environment and its associated issues. As environmental problems became more diverse and widespread, Dunlap and his colleagues sought to produce an adequate measure of an individual's overall feelings on the environment as a whole. In doing so, they developed a scale called the New Environmental Paradigm (NEP) based on tenets that "focused on beliefs about humanity's ability to upset the balance of nature, the existence of limits to growth for human societies, and humanity's right to rule over the rest of nature" (Dunlap et al., 2000 p. 427). In tests of their new scale, the authors found that "12 Likert items measuring these three facets of the new social paradigm or worldview exhibited a good deal of internal consistency...and

strongly discriminated between known environmentalists and the general public” (p. 427). As such, the NEP has become the standard for measuring environmental attitudes across a variety of populations.

Measuring environmentally friendly behaviors is a more ambiguous task. There appears to be no standard for computing an individual’s level of environmentally friendly behavior. Rather, researchers have tended to tailor their surveys and questionnaires with regard to their study populations. For example, in a survey of Egyptian students, Gillian Rice (2006) designed the questionnaire based on “the literature, press reports, and magazine articles from Egypt, as well as discussions with individuals living in Cairo, in order to ensure relevance to the respondents” (p. 382). Additionally, Stewart Barr (2003) discussed the impact of “an individual’s access to given services, their socio-demographic make-up and their knowledge and experience of the relevant behaviours” (p. 229) on their responses to behavioral surveys. As such, he implied that it would be inappropriate to use another scale to measure environmental behaviors instead of designing a list of relevant items that was more specific to the population at hand.

Conversely, the principles of Leave No Trace (LNT: Leave No Trace, 2008) are a set of rules that are generally well known. Backcountry campers are encouraged to follow LNT when they are participating in outdoor activities. Yet, a large amount of research has been done on the efficacy of these principles and personal knowledge and belief in the tenets. Melissa Daniels and Jeffrey Marion used a methodology similar to the one in this study, providing participants with a survey both before and after an educational program. While their research was broad and encompassed several different aspects of LNT, a large portion “contained 16 Likert scale items asking the respondent to choose the

level of agreement or disagreement with statements about ecological or LNT principles” (Daniels & Marion, 2005, p. 8).

ORION uses outdoor experiences with peer leaders who are strong role models and reflective journaling to help participants make the transition to college by developing social relationships and self-confidence, and increasing environmental awareness. Leave No Trace is also a major component of the educational curriculum within the program. Thus, this research was intended to explore some of these mechanical strategies and their effectiveness by analyzing student responses in a pre-test/post-test survey approach.

Chapter 3

Methods

The methods for this study were tailored to the specific and unique situation associated with the ORION program. Scheduling and timing of the questionnaires was very important, as was reaching the maximum number of participants. In addition, completing the study without interfering with the actual implementation of the Program was a significant factor in determining the methods.

Subjects

The study population for this study was the ORION participants from all four sessions during summer, 2009, provided they were over the age of 18 by the first day of their selected session. There were 220 potential subjects (based on the number of participants enrolled in the Program), all of whom were students preparing to enter their freshman year of college at Penn State.

Structure of Survey

I used a pre-test/post-test approach, with the initial questionnaire being administered prior to the Program and the post-test administered within three days following the completion of the Program. The pre-program and post-program questionnaires can be found in Appendices A and B, respectively. The general format was a series of questions on a simple Likert scale (agree-disagree). There were 15

questions referring to widespread environmental values (taken verbatim from the most recent NEP), and 10 questions specifically aimed at measuring Leave No Trace attitudes. There were also five questions dealing with environmentally friendly behavior. Within the 15 environmental value questions and the 10 Leave No Trace items, there were statements that were both negatively and positively worded. These were divided roughly half and half. In addition, there were several open-ended questions intended to provide support for the quantitative items in the survey. There was also a variety of demographic control questions such as gender, race, size of hometown, college of intended major, and whether or not the participant had prior outdoor activity experiences. Finally, participants were asked to provide the last four digits of their phone number and their five digit zip code. These items were used to create a Unique ID number for tracking purposes. Table 3-1 outlines the questions that appeared on both the pre-program and post-program questionnaires.

Table 3-1: Questionnaire Descriptions

Pre-Program Questionnaire	Post-Program Questionnaire
Participants were asked about their prior outdoor experience. Demographic variable.	What participants enjoyed most about their ORION experience. Open-ended response.
Question regarding the primary reason students chose the ORION program. Open-ended response.	Something that could be changed about the program. Open-ended response.
Environmental Attitudes. New Ecological Paradigm (Dunlap et al., 2000). A total of 15 items, with 8 positively worded and 7 negatively worded. Participants were asked to rate their response from Strongly Agree to Strongly Disagree. Scored on a scale from 5 (strongly positive) to 1 (strongly negative). Items were reverse coded where necessary.	Environmental Behavior. A total of 5 items, all positively worded and rated on a scale from Always to Never. Scored on a scale from 5 (strongly positive) to 1 (strongly negative).
Environmental Behavior. A total of 5	Leave No Trace. A total of 10 items, 3

items, all positively worded and rated on a scale from Always to Never. Scored on a scale from 5 (strongly positive) to 1 (strongly negative).	positively worded and 7 negatively worded. Participants were asked to rate the items on a scale from Definitely True to Definitely False. "I'm Not Sure" was also provided as an option. Scored on a scale with 2 points given for "definitely true/false," 1 point for "probably true/false" and zero for all other answers.
Leave No Trace. A total of 10 items, 3 positively worded and 7 negatively worded. Participants asked to rate on a scale from Definitely True to Definitely False. "I'm Not Sure" was also provided as an option. Scored on a scale with 2 points given for "definitely true/false," 1 point for "probably true/false," and zero for all other answers.	Environmental Attitudes. Measured using the New Ecological Paradigm (Dunlap et al., 2000), which included 15 total items, with 8 positively worded and 7 negatively worded. Participants were asked to rate their response from Strongly Agree to Strongly Disagree. Scored on a scale from 5 (strongly positive) to 1 (strongly negative). Items were reverse coded where necessary.
Participant's opinion of the environment as it relates to other world issues. Open-ended response.	Participant's opinion of the environment as it relates to other world issues. Open-ended response.
Participant's desire to learn more about the environment and natural world. Open-ended response.	Participant's opinion and knowledge of the Leave No Trace principles. Open-ended response.
Demographic variables. Gender, Age, Race, Hometown Size, Intended Major.	Coding Variable. 5 digit zip code
Coding Variable. 5 digit zip code	Coding Variable. Last 4 digits of home phone number
Coding Variable. Last 4 digits of home phone number	<i>NOTE: These last two items were combined to create a unique tracking ID number.</i>
<i>NOTE: These last two items were combined to create a unique tracking ID number.</i>	

Administration of the Survey

On the day that the ORION program is to begin, staff and participants are on a tightly regulated schedule, and it was determined that a paper survey would be impractical. As such, an online website was chosen as the best medium to administer the

survey. SurveyMonkey.com (SurveyMonkey, 2010) was picked as the software for the questionnaire because it is simple to use and available through Penn State. Participants were sent a link via email approximately two weeks before their involvement in the Program. The emails were sent with the official ORION information, such as gear list and course requirements. Two days after each week of the Program, all students from that week (approximately 60) were contacted again by e-mail and asked to complete the post-program questionnaire. The anonymity of participants was protected, as no Penn State ID numbers or names were collected. The IP addresses of computers completing the survey were not logged. Participants were identifiable only through their personally generated Unique ID number, which was not traceable to any one person. All subjects were informed that their participation was voluntary, and their choice to take the survey or decline had no impact on their grade for the course. For IRB exemption certification, refer to Appendix E.

Chapter 4

Results

Pre-Program Questionnaire

Following are the results from the group that took the questionnaire before completing the ORION experience, herein known as the pre-program group.

Overall, the pre-program questionnaire had a total of 59 respondents. In a potential sample size of approximately 220 participants, this gives a response rate of about 27%.

Demographics

The results were relatively evenly distributed across the demographic variables, as noted in Table 4.1. Women were slightly more numerous than men in the sample (50.9%). Over 85% of the sample reported being 18 years old, the most typically age for first year college students. Four out of five participants (80%) were white, followed by Hispanics (7.3%), and fewer than five percent of participants reported belonging to any other ethnic group. The size of respondents' hometowns was varied, with "small town" receiving the largest segment (29.1%) by a slim margin over large town and medium city. The academic majors were extremely diverse, but engineering (25.4%) was the largest section of the responses.

Table 4-1: Demographic Results Overview, Pre-Program Group

Variable	Percent
Gender	
Men	49.1
Women	50.9
Age	
17	5.5
18	85.5
19	7.3
20	1.8
Race	
White	80.0
Hispanic	7.3
Asian	3.6
Black	1.8
Pacific Islander	1.8
Multi-racial	1.8
Other	1.8
Prefer not to answer	1.8
Size of Hometown	
Farm or rural area	10.9
Small town	29.1
Large town or small city	25.5
Medium sized city	23.6
Large city	10.9
Academic Major (Recoded into categories)	
Engineering	25.4
Social Studies	18.6
Life Sciences	15.3
Others	15.3
Physical Sciences	10.2
Undecided	10.2
Arts	5.1

Participation in Outdoor Activities

To understand respondents' previous experience in the outdoors, they were asked how often they participate in each of six common outdoor activities. Respondents described their participation in each activity on a scale ranging from frequently to never

(Table 4.2). Over 57% reported participating in day hiking *frequently* or *sometimes*. In contrast, only 22% reported participating *frequently* or *sometimes* in mountain biking. Just over 40% responded that they *frequently* or *sometimes* went canoeing, 45% camped in cabins, and 30% went rock climbing.

Table 4-2: Outdoor Activity Participation, Pre-Program Group

Activity	Frequently	Sometimes	Rarely	Never
Day Hiking	13.6%	44.1%	35.6%	6.8%
Mountain Biking	3.4%	18.6%	39.0%	39.0%
Canoeing	8.5%	32.2%	42.4%	16.9%
Backpacking	3.4%	17.2%	34.5%	44.8%
Cabin Camping	6.8%	39.0%	39.0%	15.3%
Rock Climbing	6.9%	22.4%	37.9%	32.8%

These items were the primary distinguishing variables for the first group of respondents. As will be discussed later, these items became a large part of the research and analysis, as there were numerous problems relating the results of the first survey and the second survey to one another.

Quantitative Results

A significant portion of the pre-program survey was dedicated to questions regarding the New Environmental Paradigm (NEP), an environmental behavior scale, and the respondent's knowledge of the Leave No Trace (LNT) principles. The NEP scale contained 15 items, the behavioral scale had 5 items, and the LNT scale had 10 items. These were all Likert scale items, and each answer was assigned a numerical value based on how "environmentally friendly" it was. The results for each individual question can

be found in Appendix C. The answers to these questions were then re-coded and summed (within each scale) to give each individual three total scores. The graphical results are shown below:

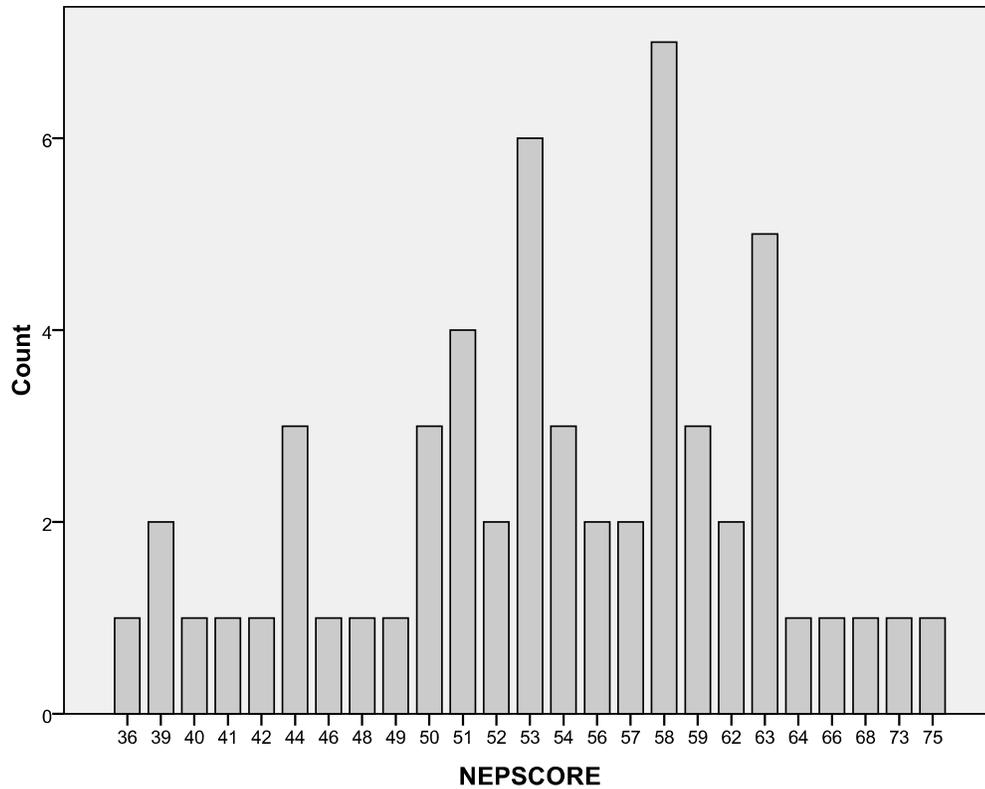


Figure 4-1: Overall New Environmental Paradigm Scores, Pre-Program Group. Summated 15 item scale with individual item scores ranging from 1 (Strongly Disagree) to 5 (Strongly Disagree) and summated scores ranging from 5 (strongly disagreeing with the NEP) to 75 (strongly agreeing with the NEP).

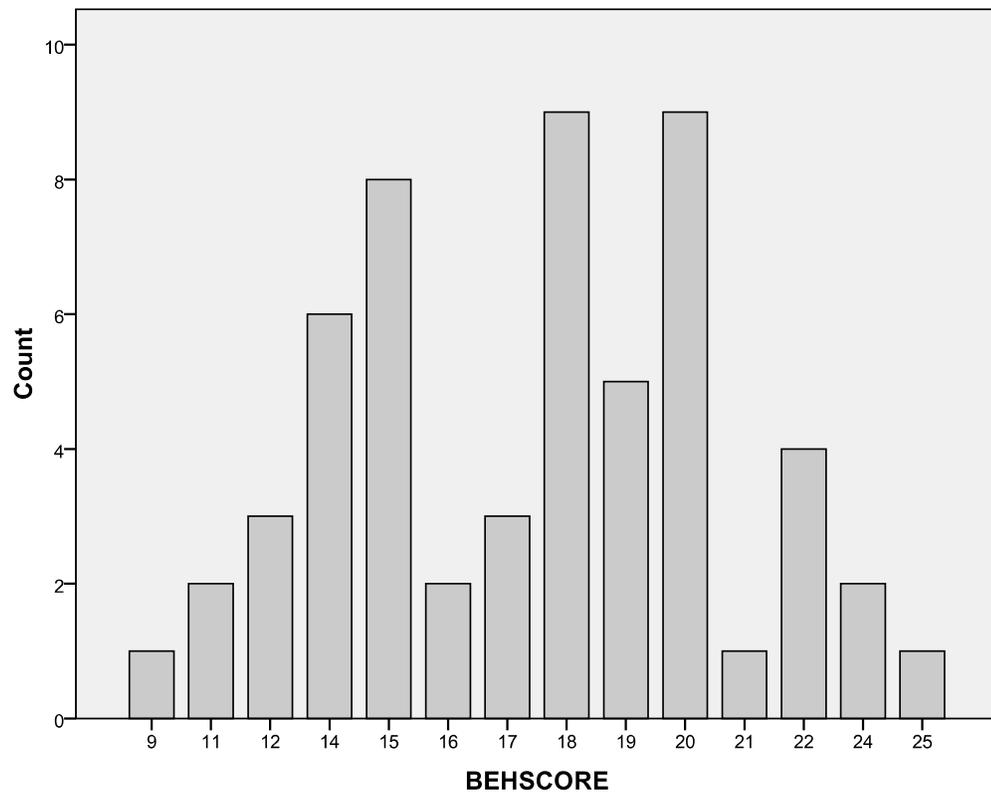


Figure 4-2: Overall Behavioral Scores, Pre-Program Group. Summated 5 item scale with individual item scores ranging from 1 (Never) to 5 (Always) and summated scores ranging from 5 (Never) to 25 (Always).

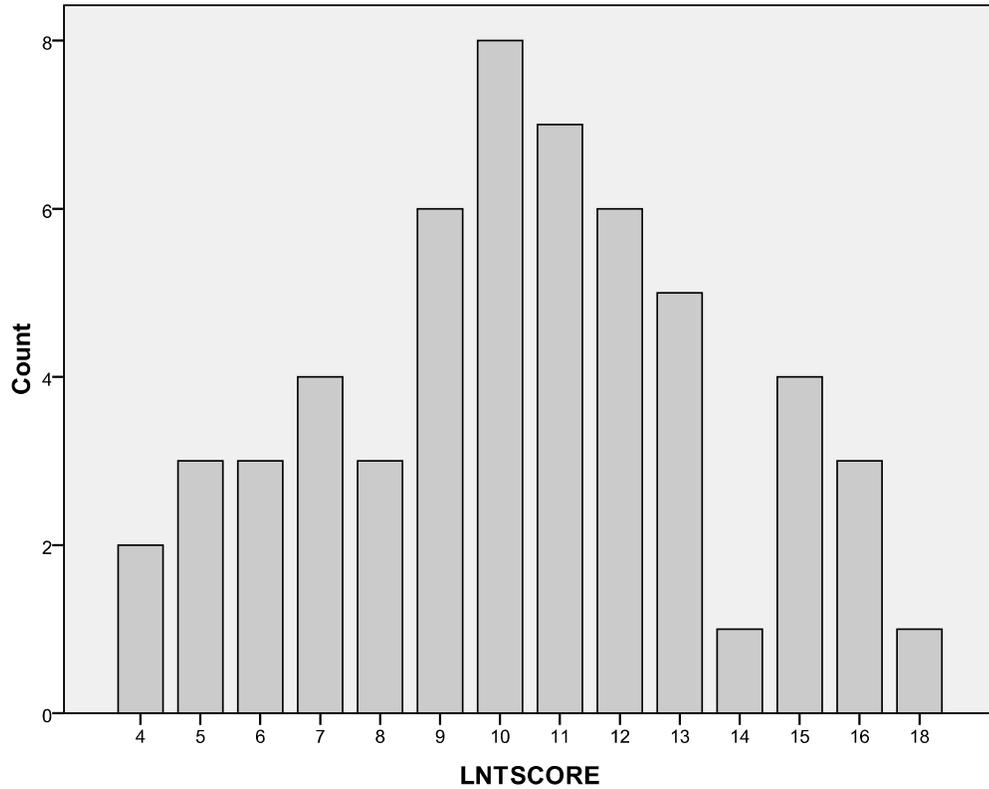


Figure 4-3: Overall Leave No Trace Scores, Pre-Program Group. Summated 10 item scale with options including: 2 (strongly positive), 1 (slightly positive) and 0 (negative). Summed score ranged from 20 (strong knowledge of LNT principles) to 0 (weak knowledge of LNT principles).

As shown, these variables conformed fairly well to the standard bell curve, especially the LNT score results. In all cases, a higher score represented a more environmentally friendly answer to the research questions. The descriptive statistics associated with each of these variables are shown in the table below:

Table 4-3: Descriptive Statistics, Pre-Program Group

	N	Minimum	Maximum	Mean	Std. Deviation
NEPScore	56	36	75	54.36	8.298
BEHScore	56	9	25	17.38	3.514
LNTScore	56	4	18	10.38	3.317

Note: NEPScore is a summated 15-item scale ranging from 75 (strongly positive) to 5 (strongly negative). BEHScore is a 5-item summated scale ranging from 25 (strongly positive) to 5 (strongly negative). LNTScore is a 10-item summated scale ranging from 20 (strong knowledge) to 0 (weak knowledge).

Qualitative Results

Students were also asked to complete a number of open-ended response questions. These had a lower response rate, but also provided a large amount of useful data. For each open-ended question, I used content analysis to identify recurring themes amongst the responses. Some answers contained more than one distinct theme, and, in these cases, answers were assigned a code based on the first theme. A second researcher reviewed my coding, and differences in judgment were resolved through discussion. After differences were resolved, the number of responses in each category was calculated.

The first open-ended question focused on why students chose to participate in ORION. Answers were grouped into five categories (Table 4-4). While there were a number of interesting answers, most were geared towards building social relationships, enjoyment of backpacking or the outdoors, and trying a new experience. A sampling of comments is below:

It sounds like something fun and new I'd enjoy, and I want to meet new people! – Categorized as “meet new people”

I love camping and hope to meet others who enjoy the outdoors as much as I do. – Categorized as “enjoy backpacking/outdoors”

Wanted to get out, do something and meet new people. – Categorized as “meet new people”

Table 4-4: Why ORION?, Pre-Program Group

Category	Percentage of Responses
Meet new people	42.0%
Enjoy backpacking/outdoors	24.0%
New experience	20.0%
Learning experience	10.0%
A good transition to college	4.0%

The second open ended question that respondents were asked to answer was the following: “When you think about the environment as compared to other issues in today's world, where would you rank it? Why?” Again, the responses were extremely varied. Some chose to rate the environment on a scale of 1 to 10, while others used a ranking system (1st, 2nd, etc), and still others did not rank issues at all. In response, answers were coded into four categories based on the importance assigned to environment in

comparison to “other issues in today’s world” (Table 4-5). A few representative responses:

I think it is most important, because if we do not rectify the way we deal with the environment soon, our way of life will cease to exist. –
Categorized as “very important”

I think that there are other important issues in the world right now. –
Categorized as “not very important”

I would rank it very highly because humanity depends on the environment to support life. – Categorized as “very important”

Table 4-5: Environmental Rank, Pre-Program Group

Category	Percentage of Responses
Environment is very important	58.8%
Environment is somewhat important	31.4%
Environment is not very important	7.8%
Answer not applicable	2.0%

Clearly, the trend in these responses was towards a higher environmental preference. Many of these answers were very in-depth and showed a large amount of knowledge about environmental issues and problems.

The final open-ended question dealt with what participants wanted to learn about environmental issues, camping, and the outdoors or society in general. This question was deliberately left very broad so as to allow the students to provide their own answer, and this was reflected in the wide variety of responses given. Many were extremely specific, but others were very broad such as simply wanting to learn “more” about the environment. Some responses were focused on environmental issues that can be addressed by personal action (e.g., reducing consumption and waste). Other responses

were focused on environmental issues that need to be addressed by society as a whole, such as alternative energy or deforestation. From these responses, four categories emerged (Table 4-6). Some particularly interesting answers are given below:

I would like to learn more about habitat destruction and how it affects wildlife and in turn human populations. – Categorized as “societal and then personal”

I would like to learn more about how to use resources more efficiently. – Categorized as “personal”

The effects of estrogens from plastics on the water supply. – Categorized as “societal”

Table 4-6: Environmental Learning, Pre-Program Group

Category	Percentage of Responses
Issues of societal control	58.1%
Issues of personal control	18.6%
Issues of societal control followed by issues of personal control	16.3%
Issues of personal control followed by issues of societal control	7.0%

Nearly three-fifths of the responses were focused on learning more about issues that revolved around societal control (e.g., alternative energy, deforestation, etc), whereas less than one-fifth were focused on issues that revolve around individual control. Among the responses that included both types of issues, issues of social control were mentioned first more than twice as often as issues of personal control.

Post-Program Group

The post-program group was comprised of 67 students that completed a questionnaire after finishing the ORION program. With a potential sample of 220

respondents, the response rate was about 30%, slightly higher than the pre-program questionnaire. Demographic data were not collected from this group because it was anticipated that many students would complete both pre- and post-program questionnaires. Instead, the post-program survey repeated the quantitative scales for NEP, environmental behavior, and LNT that were contained in the pre-program questionnaire, and the post-program questionnaire also included qualitative variables geared towards analyzing the participant's reactions to the ORION program.

Quantitative Results

The NEP, BEH and LNT items were the same for both the pre-program and post-program questionnaires. As before, the individual question scores were summed to create a composite score. The individual results for each question can be found in Appendix D. In all cases, a higher score indicates a higher environmental preference. The charts below graphically illustrate the post-program results.

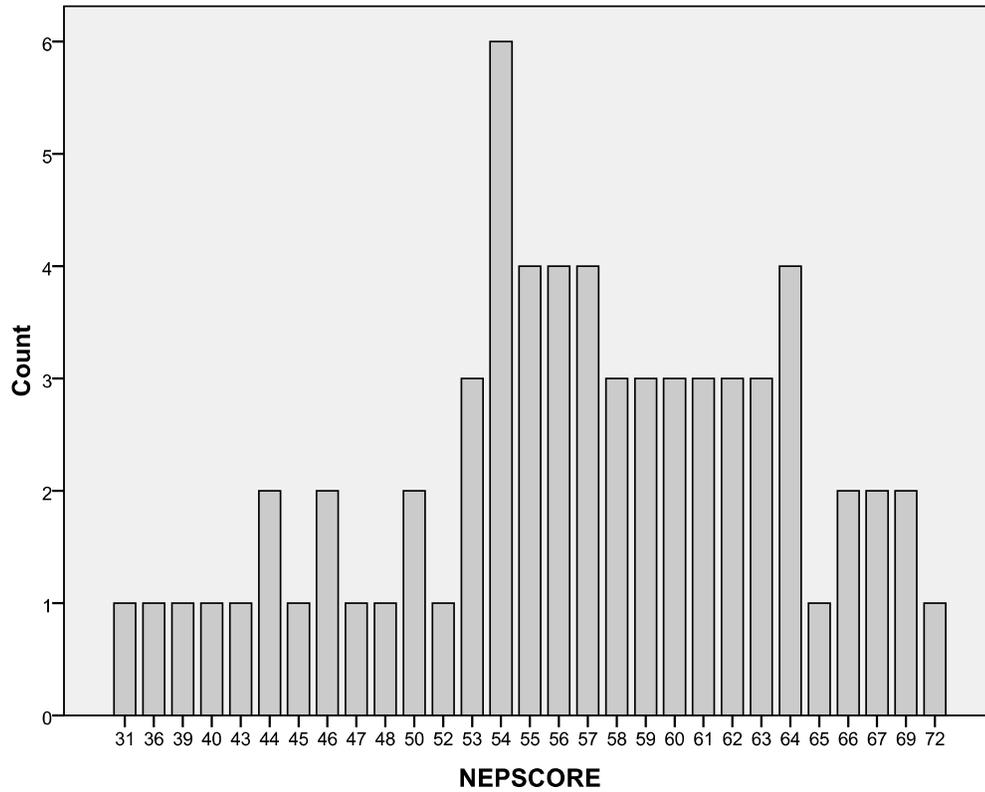


Figure 4-4: Overall New Environmental Paradigm Scores, Post-Program Group. Summated 15 item scale with individual item scores ranging from 1 (Strongly Disagree) to 5 (Strongly Disagree) and summated scores ranging from 5 (strongly disagreeing with the NEP) to 75 (strongly agreeing with the NEP).

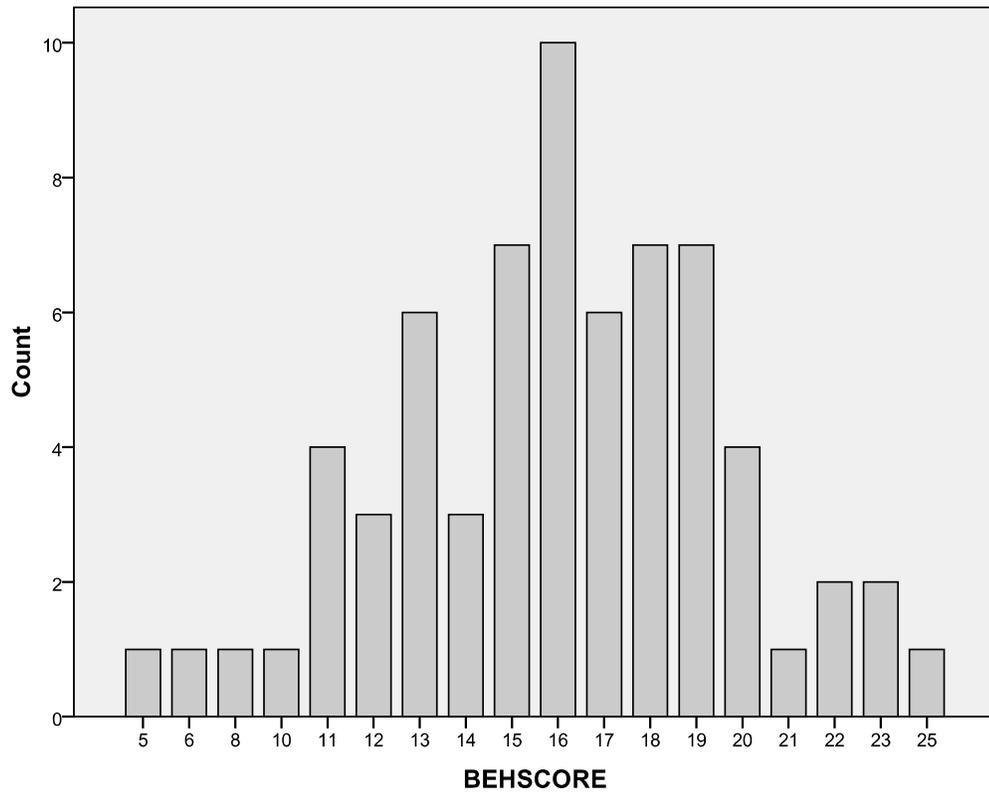


Figure 4-5: Overall Behavioral Scores, Post-Program Group. Summated 5 item scale with individual item scores ranging from 1 (Never) to 5 (Always) and summated scores ranging from 5 (Never) to 25 (Always).

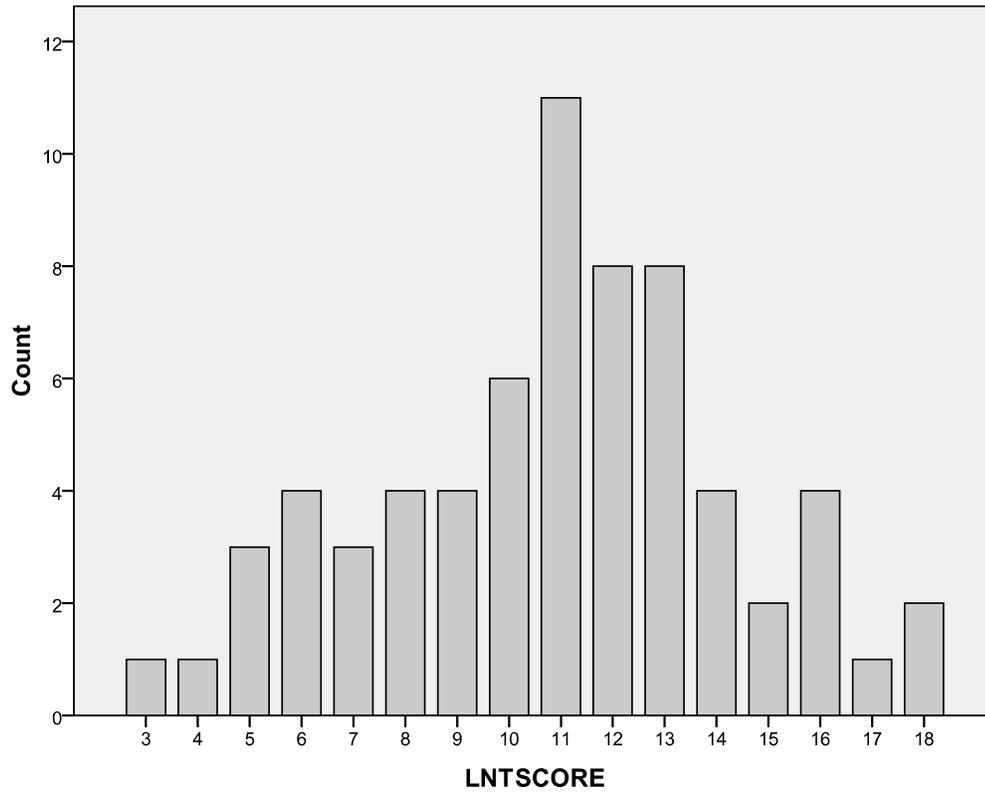


Figure 4-6: Overall Leave No Trace Scores, Post-Program Group. Summated 10 item scale with options including: 2 (strongly positive), 1 (slightly positive) and 0 (negative). Summed score ranged from 20 (strong knowledge of LNT principles) to 0 (weak knowledge of LNT principles).

As before, these results generally followed the bell curve. The descriptive statistics for each of these variables was as follows (Table 4.7):

Table 4-7: Descriptive Statistics, Post-Program Group

	N	Minimum	Maximum	Mean	Std. Deviation
NEPSCORE	66	31	72	56.09	8.255
BEHSCORE	67	5	25	15.99	3.851
LNTSCORE	66	3	18	10.89	3.438

Note: NEPSCORE is a summated 15-item scale ranging from 75 (strongly positive) to 5 (strongly negative). BEHSCORE is a 5-item summated scale ranging from 25 (strongly positive) to 5 (strongly negative). LNTSCORE is a 10-item summated scale ranging from 20 (strong knowledge) to 0 (weak knowledge).

Qualitative Results

In addition to the Likert scale items on the post-program survey, there were a series of open-ended questions for respondents to answer. After the results were collected, general categories were determined for the responses to each of the questions. Overall, there were four open-ended questions on the post-program questionnaire.

The first question was: “What did you enjoy the most about the ORION program?” Overwhelmingly, the answers were related to the people involved in the experience, whether it was meeting new friends or enjoying the time spent with others in close contact. Of the 67 responses, 58 were linked to either the leaders or the other participants, for a percentage total of 86.6%. Other answers such as the exercise, great views, and new hobbies made up the remaining 13.4%.

A representative sampling of quotes is shown below:

Without a doubt, the people I shared the experience with were what made it so great. Friendly, funny, humble, and personable leaders who really got on our level rather than act "above" us as authority figures can, and a

great group of incoming freshmen who were all eager to make new friends.

I appreciated the fact that regardless of how far away you lived, what your interests were, or what your personality was, everyone respectively put aside their differences and simply wanted to become acquainted to their group members. It was really something special to see on the trip, but even more impressive that all the members from my group still plan things together and communicate frequently.

I liked meeting new people while backpacking. I liked this because in the woods you can really find out what others, and yourself, are made of. This is also the perfect environment for making new friends and having a great time. Perhaps more than the hiking part of the trip, I will remember all of the new friends I made during ORION.

An interesting note regarding these answers is that they tended to be much longer (in terms of words) than most of the answers in the pre-program survey. It appeared that participants were much more likely to discuss in depth the reasons they like the Program than their reasons for initially signing up.

The second open-ended question focused on what students would change about ORION. The answers to this question were very diverse, and even among those that touched on the same issues (food or hiking for example), participants had different views (Table 4-8). For example, some wanted to carry more food, while others felt they carried too much. Three representative quotations are shown below.

I would suggest to make it [sic] maybe just a little bit longer. I would have liked extra time with both my leaders and the other kids in my group.

The program is well-constructed as is, allowing for group growth and development of relationships while still introducing participants to the physical, environmental and psychological benefits of a "Leave No Trace"-style backpacking trip.

Nothing, really. I had a blast and it fulfilled all of my expectations.” Many of these responses were hesitant to find a flaw, and some were prefaced with disclaimers such as: “if I had to pick something...

Table 4-8: Qualitative Variable “CHANGE”, Post-Program Group

Response Category	N	Percent
“Nothing” or no changes	24	35.8%
Other/assorted	12	17.9%
Teambuilding activities or games	11	16.4%
Additional adventure (canoeing or high ropes)	5	7.5%
Amount of hiking (more or less)	5	7.5%
Maps/navigational issues	5	7.5%
Food	2	3.0%
No response	3	4.5%
Total	67	100%

The third question about ranking the environment as an issue in today’s world was also included on the post-program questionnaire. The table below shows the resulting categories, relevant percentages, and case counts.

Table 4-9: Environmental Rank, Post-Program Group

Response Category	N	Percent
Environment is very important	42	68.9%
Environment is somewhat important	16	26.2%
Environment is not very important	1	1.6%
Answer not applicable/not relevant	2	3.3%
Total	61	100%

The final qualitative item on the post-program questionnaire was specifically designed to target the respondent’s knowledge and appreciation of the Leave No Trace principles that they were taught over the course of the program. The question read “What do you know about the Leave No Trace principles? What makes sense to you about them, and what if anything would you change?” Participants responded to this question in very different ways, as illustrated by the two quotations below:

I know all of them. I feel that it is something everyone who is in the wilderness should strive to follow because it helps preserve the beauty of the surroundings for others for many years to come.

I think it's a good idea, but in practice, seems a little extreme. If a small piece of food falls, it's really not going to change the world if no one picks it up. I think it just needs to be calmed down a little bit.

Because responses were so diverse, they were categorized into two simple groupings (Table 4-10).

Table 4-10: LNT Principles, Post-Program Group

Response Category	N	Percentage
Understand principles and agree	53	85.5%
Understand and disagree w/ one	9	14.5%
Total	62	100%

It is notable that none of the participants expressed disagreement with the LNT principles. As a whole, the group definitely understood the principles of Leave No Trace, and many of the answers mentioned specific tenets that were taught in the course. However, even among those that agreed with the principles, some participants objected to or expressed uncertainty about one specific principle or expressed the belief that the principles were good but “too extreme”. This was noted on more than one occasion by multiple respondents. Overall, ten respondents mentioned that they thought one or more of the principles were too intense in some way. Five responses dealt with food waste, three with bathroom etiquette (specifically toilet paper), and two mentioned fires. One did not state a specific principle. In contrast, it was interesting to note that four responses said the only thing they would change would be to increase education and enforcement of the principles, a stark difference from some of the other answers.

Comparison of Pre- and Post-Program Results

A primary goal of this study was to survey ORION participants before and after their trips to test for possible changes in environmental attitudes (NEP), environmental behavior, and knowledge about the LNT principles. All program participants were encouraged to complete the post-trip questionnaire, but analysis of unique ID numbers revealed that only nine entries had corresponding ID numbers, meaning that there was an extremely small sample size with which to compare pre- and post-program responses. This sample size is so small that there was little power to detect statistical differences, and sample's representativeness was questionable. Therefore, rather than conduct a paired analysis on these nine individuals, it was decided to conduct a two-sample analysis comparing the individuals who completed the pre-program questionnaire to the individuals who completed the post-program questionnaire.

NEP, BEH and LNT Across Groups

Using a series of three one-way ANOVA tests, means for the pre- and post-program groups were compared and the significance of the values was determined (Table 4-11).

Table 4-11: NEP, BEH and LNT Scores, Across Groups

Variable	Pre-Program	Post-Program	Change	Significance
	Mean	Mean		
NEPSCORE	54.36	56.09	1.73	0.251
BEHSCORE	17.38	15.99	-1.39	0.040
LNTSCORE	10.38	10.89	0.51	0.400

Maximums: NEPSCORE (75), BEHSCORE (25), LNTSCORE (20)

At the 0.05 significance level, only the BEHSCORE change was marginally significant. However, the change was not in the expected direction, as the value actually decreased after the program as compared to before the program. The NEPScore and the LNTScore marginally increased, but neither was statistically significant. These values must be viewed with skepticism, as the lack of crossover between individuals means that almost an entirely different set of respondents completed the pre-program and post-program surveys. Thus, the students who responded to the second questionnaire may have had lower scores before the program, but these were not captured in the first survey.

Additional Analyses of Subgroup Differences

Additional analyses were conducted to compare responses of different demographic subgroups among students who completed pre-program questionnaires. The subgroups included gender and size of hometown. These variables were chosen because they showed the greatest diversity as compared to the other demographic item. Various analyses were performed with both of these demographic variables, although some comparisons were done with only one or the other. The post-program questionnaire did not include demographic variables, so similar analysis was not possible for that group.

Environmental Learning by Gender

The results of the survey item regarding what participants wanted to learn about the environment were very interesting. Using the original categories and running a simple cross tabulation analysis against the gender of respondents, females were found to be

more likely to mention issues of societal control in their response (75% overall), even if they discussed more than one topic. However, this relationship was not statistically significant ($p = .271$), and this is likely due to the small sample size. In addition, females were also more likely to provide a response that included more than one issue at a rate of only 29.2% versus 15.8% for males.

Table 4-12: Environmental Learning by Gender, Pre-Program Group

Responses	N	Percentage (within gender)
	<i>Males</i>	
Personal control	3	15.8%
Societal control	13	68.4%
Both, personal first	2	10.5%
Both, societal first	1	5.3%
Subtotal	19	100%
	<i>Females</i>	
Personal control	5	20.8%
Societal control	12	50.0%
Both, personal first	1	4.2%
Both, societal first	6	25.0%
Subtotal	24	100%
Total	43	100%

$p = .271$

NEP, BEH and LNT by Gender and Hometown Size

An analysis of the total NEP, BEH and LNT scores against the demographic variables for gender and area of hometown was done in much the same way as the overall comparison between the pre and post program groups. However, because demographic

data was not available for the post-program group, a cross-over analysis was not possible.

Instead, a summary of the pre-program survey group's responses are reviewed.

In terms of the gender data, none of these comparisons were significant, even at the 0.1 level (Table 4.13).

Table 4-13: NEP, BEH and LNT Scores by Gender, Pre-Program Group

Variable	N	M Mean	F Mean	Difference	Significance
NEP Score	55	52.52	56.21	3.89	.102
BEH Score	55	18.11	16.79	2.32	.164
LNT Score	55	10.67	9.93	0.74	.410

An analysis was also conducted to determine if the size of a student's hometown could be used to predict their scores on the NEP, BEH and LNT (Table 4-14).

The only significant set of figures in this analysis was with the LNT. Oddly, the rural and large city had the highest rate of knowledge about the LNT principles, while the middle tier categories were drastically lower. This could be due to the relatively small overall sample size (N=55), as well as the small number of respondents in the rural and large city categories (N=6 in both cases).

Table 4-14: Means by Hometown Size, Pre-Program Group

Hometown Size	NEP Mean	BEH Mean	LNT Mean
Farm or rural area	59.67	20.00	13.00
Small town	50.94	16.81	9.56
Large town or small city	54.64	17.43	9.43
Medium sized city	56.69	17.69	9.38
Large city	52.83	16.00	13.50
Significance	.175	.319	.009

Outdoor Activities by Gender

An analysis of the gender of participants against their outdoor activity experience was run in an attempt to discover if males or females were more likely to have participated in similar endeavors prior to the ORION program. Again using a comparison of means test based on the Likert scale data collected from the pre-program survey, each individual activity as well as the overall score were analyzed (Table 4-15):

Table 4-15: Outdoor Activity Experience, by Gender in Pre-Program Group

Activity	Male Mean	Female Mean	Difference	Significance
Day Hiking	2.89	2.36	0.53	.008
Mountain Biking	2.07	1.68	0.39	.089
Canoeing	2.41	2.25	0.16	.514
Backpacking	2.07	1.56	0.51	.023
Cabin Camping	2.41	2.32	0.09	.703
Rock Climbing	2.07	2.00	0.07	.768
Overall Score	13.93	12.04	1.89	.042

Note: Higher scores indicate a greater incidence of that activity

In this case, there was a tremendous amount of significance at several levels. In all activities, males were numerically more likely to have engaged in outdoor activities. Day hiking (0.008) and backpacking (0.023) were significant at the 0.05 level, and mountain biking (0.089) was significant at the 0.1 level. Overall, the activity score mean difference showed a significance of 0.042, which is supported at the 0.05 level. The conclusions that can be drawn from this data are in line with the belief that, in general, males are more likely to come into ORION with some experience in the outdoor setting.

Why Participation in ORION by Gender

Finally, information about why participants chose the ORION program was addressed. The results are displayed in Table 4-16.

Table 4-16: N of Why ORION by Gender, Pre-Program Group

Response Category	Male N	Female N
New experience	3	8
Meet new people	14	9
Good transition to college	1	1
Enjoy backpacking	8	6
Learning experience	0	3
Other	1	1
Total	27	28

p = .250

It was interesting to note that males were more likely to want to “meet new people.”

Females were more likely to want a “new experience,” which is in line with the previous finding that males have more outdoor background than females entering the program.

However, none of these relationships were statistically significant (p = .250), again suggesting that the small sample size may have impacted the results.

Chapter 5

Conclusions and Further Research

Concrete conclusions were very difficult to draw from the research undertaken in this study. While the premise and initial plan was sound, the methods failed to capture the number of cross-over respondents to make a proper pre-test/post-test analysis feasible. From looking at the pre-program group and post-program groups alone, few results were significant to the level where a relationship could be determined. Thus, the original intentions of the study were not satisfied.

However, a fair amount of information was able to be taken from the results. In general, it was found that ORION participants did not have significant outdoor experience, which is consistent with general program expectations. Males were found to have significantly more experience than females. There was also found to be a wide distribution between the sizes of participants' hometowns.

In one of the only cross-over analyses, it was found that the plurality of students (42%) said that they participated in ORION primarily because they were interested in meeting new people, and in the post-program group 86.6% of respondents mentioned the other people being their favorite part of the experience. Clearly, social interaction and friendship is one goal of the program that is being fulfilled. This is consistent with most adventure programming literature, which describes social interaction as a major component of outdoor programs.

In addition, students placed a high value on the environment, as evidenced by their comparison of the environment to other world issues. This is consistent with the fairly high NEP scores in the pre-program and post-program response groups. The environmental goals of the program were difficult to evaluate with the data gathered in this study. In terms of Leave No Trace, participants overwhelmingly responded that they knew and accepted the principles with very slight (~15%) dissent. As this is a key educational component of the ORION program, this was not entirely unexpected. However, this was not entirely consistent with the reported LNT scores, as both groups exhibited mean scores in the middle region of the spectrum. The pre-program group also expressed a very high level of wanting to learn about societal environmental issues as opposed to those of personal control. Although this was interesting, there was no item on the questionnaire that pertained to why a student chose either a societal or personal environmental issues, and thus there was no data to determine a reason behind the answers. A possible explanation for this data could be the societal issues are more complex than those under personal control, and students felt that there was more to learn about these topics.

In order to fulfill the original intentions of this study, further research is necessary. Specifically, a method that ensures participants will complete both pre- and post-program questionnaires is critical. Additionally, striving for a higher response rate would improve the quality of the analysis. This could be done by using increased advertising or repeated emails to participants both before and after the program.

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Appendix A

Pre-Program Questionnaire

ORION Environmental Attitudes Survey

Informed Consent

ABOUT THIS QUESTIONNAIRE

Please read this information before beginning the questionnaire.

The ORION program is designed primarily to introduce incoming students to life at Penn State while building relationships with peers in wilderness setting. Another aspect of the program is learning more about environmentally responsible behavior. Completing this survey will help the ORION program improve its teaching protocol.

Participation is confidential and voluntary.

If you agree to participate in this research, you will be asked to complete this survey and one additional survey after finishing the ORION program.

Completing the survey will take 15-20 minutes. All your answers will be kept confidential, and you will not be asked for any information that would identify who the responses belong to.

In the event of any publication or presentation resulting from this research, no personally identifiable information will be shared because your name is not linked to your responses. All data will be grouped for reporting purposes.

Your participation in this research is completely voluntary. You may choose not to participate, and your choice will have no effect on your grade for the course. You may skip any question, and you may quit at any time. At the end of the questionnaire, you will be asked to create an ID number consisting of your home ZIP code and the last four digits of your telephone number. This information is for tracking purposes only. Your confidentiality will be kept to the degree permitted by the technology used. No guarantees can be made regarding the interception of data sent via the Internet by any third parties.

Please note that this implied consent form only applies to the PRE-PROGRAM study. You will be asked again for your consent before completing the post-program survey.

You have a right to ask questions.

This research is being conducted by Nicholas Clabbers and Dr. Harry Zinn in the Department of Recreation, Park and Tourism Management at Penn State University. If you have questions or want to know more about the survey, please contact Nicholas Clabbers or Harry Zinn using the following information:

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You must be 18 years of age or older to participate in this survey. Completion of the survey implies that you have read the information on this page and consent to take part in the research. Please feel free to print this page and keep it for your records or future reference.

ORION Environmental Attitudes Survey

We are interested in your previous outdoor experience, and why you decided to participate in the ORION program.

How often do you do each of the following?

	Frequently	Occasionally	Rarely	Never
Day Hiking	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mountain Biking	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Canoeing/Kayaking	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Overnight Backpacking	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cabin Camping	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Rock Climbing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

What is the major reason you chose to participate in the ORION program?

ORION Environmental Attitudes Survey

Listed below are a series of statements about the relationship between humans and the environment. For each one, indicate if you STRONGLY AGREE, MILDLY AGREE, are UNSURE, MILDY DISAGREE, or STRONGLY DISAGREE.

	STRONGLY AGREE	MILDLY AGREE	UNSURE	MILDY DISAGREE	STRONGLY DISAGREE
We are approaching the limit of the number of people the Earth can support.	<input type="radio"/>				
Humans have the right to modify the natural environment to suit their needs.	<input type="radio"/>				
When humans interfere with nature it often produces disastrous consequences.	<input type="radio"/>				
Human ingenuity will insure that we do NOT make the earth unlivable.	<input type="radio"/>				
Humans are severely abusing the environment.	<input type="radio"/>				
The earth has plenty of natural resources if we just learn how to develop them.	<input type="radio"/>				
Plants and animals have as much right as humans to exist.	<input type="radio"/>				
The balance of nature is strong enough to cope with the impacts of modern industrial nations.	<input type="radio"/>				
Despite our special abilities humans are still subject to the laws of nature.	<input type="radio"/>				
The so-called "ecological crisis" facing humankind has been greatly exaggerated.	<input type="radio"/>				
The earth is like a spaceship with very limited room and resources.	<input type="radio"/>				
Humans were meant to rule over the rest of nature.	<input type="radio"/>				
The balance of nature is very delicate and easily upset.	<input type="radio"/>				
Humans will eventually learn enough about how nature works to be able to control it.	<input type="radio"/>				
If things continue on their present course, we will soon experience a major ecological catastrophe.	<input type="radio"/>				

ORION Environmental Attitudes Survey

Listed below are a series of statements about your personal behavior. For each one, indicate if you follow the statement ALWAYS, FREQUENTLY, SOMETIMES, RARELY, NEVER.

	ALWAYS	FREQUENTLY	SOMETIMES	RARELY	NEVER
I recycle bottles, cans and paper even when it is not convenient to do so.	<input type="radio"/>				
I buy biodegradable and recycled products whenever possible.	<input type="radio"/>				
I choose products with minimal packaging material whenever possible.	<input type="radio"/>				
Whenever possible, I buy foods that are produced in an environmentally friendly manner.	<input type="radio"/>				
I try to limit the amount of time I spend in the shower to conserve water.	<input type="radio"/>				

ORION Environmental Attitudes Survey

Listed below are a series of statements about camping. Please indicate whether you think the statement is DEFINITELY TRUE, PROBABLY TRUE, PROBABLY FALSE, DEFINITELY FALSE, or I'M NOT SURE OF THE BEST ANSWER.

NOTE: We will discuss all of these issues during the trip, so if you are unsure about the best answer, feel free to choose the I'M NOT SURE option.

	DEFINITELY TRUE	PROBABLY TRUE	PROBABLY FALSE	DEFINITELY FALSE	I'M NOT SURE OF THE BEST ANSWER
Some of the most attractive places to camp can be easily damaged by campers.	<input type="radio"/>				
It is OK to camp close to another group in the wilderness.	<input type="radio"/>				
If people want a campfire and there isn't a fire ring present, they should gather some rocks and build one.	<input type="radio"/>				
It is OK to feed human food to wildlife.	<input type="radio"/>				
The natural environment can be easily damaged by visitors.	<input type="radio"/>				
It's OK for campers to bury biodegradable food waste (like apple cores and orange peels).	<input type="radio"/>				
Collecting a few rocks or feathers as souvenirs of an outdoor visit is OK.	<input type="radio"/>				
Taking a shortcut from a trail is OK when someone is in a hurry.	<input type="radio"/>				
Park rangers should be able to limit the number of visitors to protect park resources.	<input type="radio"/>				
People should have a right to camp on public land any time they want.	<input type="radio"/>				

ORION Environmental Attitudes Survey

Open Ended Questions

When you think about the environment as compared to other issues in today's world, where would you rank it? Why?

What are some environmental issues that you would like to learn more about? These can be either specific to camping or more general issues.

ORION Environmental Attitudes Survey

Please tell us a little bit about yourself.

What is your gender?

- Male
 Female

How old are you?

What is your race?

- White
 Black
 Asian
 Hispanic
 Pacific Islander
 Multi-racial
 Other
 I prefer not to list my race.

Which of the following categories best describes the area where you live?

- Farm or rural area
 Small town (fewer than 10,000 people)
 Large town or small city (at least 10,000 people but less than 50,000)
 Medium sized city, including suburbs (at least 50,000 people but less than 250,000)
 Large city, including suburbs (250,000 people or more)

What is your intended major? If you are unsure or undecided, indicate as such.

The following information is being collected for tracking purposes only. It will be used to create an anonymous ID number.

What is your home ZIP code?

What are the last four digits of your telephone number?

Thank you for your time and providing us with this valuable information.

If you want to review or change any of your answers before submission, click the PREVIOUS button below. When you are ready to submit your answers, click DONE and your answers will be recorded.

Appendix B

Post-Program Questionnaire

ORION Environmental Attitudes Follow-Up Survey	
Informed Consent	
ABOUT THIS QUESTIONNAIRE	
Please read this information before beginning the questionnaire.	
The ORION program is designed primarily to introduce incoming students to life at Penn State while building relationships with their peers in a wilderness setting. However, an educational aspect of the program is Leave No Trace ethics and environmentally responsible behavior. Completing this survey will better help the staff to orient their instruction in this department.	
Participation is confidential and voluntary	
If you agree to participate in this research, completing the survey will take 15-20 minutes. All your answers will be kept confidential, and you will not be asked for any information that would identify who the responses belong to.	
In the event of any publication or presentation resulting from this research, no personally identifiable information will be shared because your name is not linked to your responses. All data will be grouped for reporting purposes.	
Your participation in this research is completely voluntary. You may choose not to participate, and your choice will have no effect on your grade for the course. You may skip any question, and you may quit at any time. At the end of the questionnaire, you will be asked to create an ID number consisting of your home ZIP code and the last four digits of your telephone number. This information is for tracking purposes only. Your confidentiality will be kept to the degree permitted by the technology used. No guarantees can be made regarding the interception of data sent via the Internet by any third parties.	
You have a right to ask questions	
This research is being conducted by Nicholas Clabbers and Dr. Harry Zinn in the Department of Recreation, Park and Tourism Management at Penn State University. If you have questions or want to know more about the survey, please contact Nicholas Clabbers or Harry Zinn using the information below:	
<p>Dr. Harry C. Zinn Penn State University Dept. of Recreation, Park & Tourism Mgmt. 801 Ford Building University Park, PA 16802 Phone: (814) 863-7840 E-mail: hzinn@psu.edu</p>	
<p>Nicholas Clabbers 616 West College Avenue, Apt#3 State College, PA 16801 Phone: (215) 350-0908 E-mail: nmc5051@psu.edu</p>	
You must be 18 years of age or older to participate in this survey. Completion of the survey implies that you have read the information on this page and consent to take part in the research. Please feel free to print this page and keep it for your records or future reference.	

ORION Environmental Attitudes Follow-Up Survey

We are interested to know what you thought about your ORION experience.

What did you like most about your ORION experience?

What is something that could be changed about the program to make it better?

ORION Environmental Attitudes Follow-Up Survey

Listed below are a series of statements about your personal behavior. For each one, indicate if you follow the statement NEVER, RARELY, SOMETIMES, FREQUENTLY, or ALWAYS.

	NEVER	RARELY	SOMETIMES	FREQUENTLY	ALWAYS
I recycle bottles, cans and paper even when it is not convenient to do so.	<input type="radio"/>				
I buy biodegradable and recycled products whenever possible.	<input type="radio"/>				
I choose products with minimal packaging material whenever possible.	<input type="radio"/>				
Whenever possible, I buy foods that are produced in an environmentally friendly manner.	<input type="radio"/>				
I try to limit the amount of time I spend in the shower to conserve water.	<input type="radio"/>				

ORION Environmental Attitudes Follow-Up Survey

Listed below are a series of statements about how you would behave in the backcountry. For each statement, indicate whether you STRONGLY AGREE, MILDLY AGREE, are UNSURE, MILDLY DISAGREE, or STRONGLY DISAGREE.

	STRONGLY AGREE	MILDLY AGREE	UNSURE	MILDLY DISAGREE	STRONGLY DISAGREE
Selecting an attractive place to camp is more important to me than finding a durable campsite.	<input type="radio"/>				
It is OK to camp close to another group in the wilderness.	<input type="radio"/>				
If I want a campfire and there isn't a fire ring present, I should gather some rocks and build one.	<input type="radio"/>				
It is acceptable to feed wildlife human food.	<input type="radio"/>				
The natural environment is very fragile and easily degraded by visitor use.	<input type="radio"/>				
I would postpone a trip to my favorite area if I thought my visit would be harmful to wildlife at that time.	<input type="radio"/>				
Collecting a few rocks or feathers as souvenirs of my outdoor visit is OK.	<input type="radio"/>				
Cutting a switchback is OK, especially if I am in a hurry.	<input type="radio"/>				
Public land managers should be able to limit visitation to protect park resources.	<input type="radio"/>				
I should have a right to camp on public land any time I want.	<input type="radio"/>				

ORION Environmental Attitudes Follow-Up Survey

Listed below are a series of statements about the relationship between humans and the environment. For each one, indicate if you STRONGLY AGREE, MILDLY AGREE, are UNSURE, MILDY DISAGREE, or STRONGLY DISAGREE.

	STRONGLY AGREE	MILDLY AGREE	UNSURE	MILDY DISAGREE	STRONGLY DISAGRE
We are approaching the limit of the number of people the Earth can support.	<input type="radio"/>				
Humans have the right to modify the natural environment to suit their needs.	<input type="radio"/>				
When humans interfere with nature it often produces disastrous consequences.	<input type="radio"/>				
Human ingenuity will insure that we do NOT make the earth uninhabitable.	<input type="radio"/>				
Humans are severely abusing the environment.	<input type="radio"/>				
The earth has plenty of natural resources if we just learn how to develop them.	<input type="radio"/>				
Plants and animals have as much right as humans to exist.	<input type="radio"/>				
The balance of nature is strong enough to cope with the impacts of modern industrial nations.	<input type="radio"/>				
Despite our special abilities humans are still subject to the laws of nature.	<input type="radio"/>				
The so-called "ecological crisis" facing humankind has been greatly exaggerated.	<input type="radio"/>				
The earth is like a spaceship with very limited room and resources.	<input type="radio"/>				
Humans were meant to rule over the rest of nature.	<input type="radio"/>				
The balance of nature is very delicate and easily upset.	<input type="radio"/>				
Humans will eventually learn enough about how nature works to be able to control it.	<input type="radio"/>				
If things continue on their present course, we will soon experience a major ecological catastrophe.	<input type="radio"/>				

ORION Environmental Attitudes Follow-Up Survey

Open Ended Questions

When you think about the environment as compared to other issues in today's world, where would you rank it? Why?

What do you know about the Leave No Trace principles? What makes sense to you about them, and what if anything would you change?

ORION Environmental Attitudes Follow-Up Survey

Please tell us a little bit about yourself.

The following information is being collected for tracking purposes only. It will be used to create an anonymous ID number.

What is your home ZIP code?

What are the last four digits of your telephone number?

Thank you for your time and providing us with this valuable information.

If you want to review or change any of your answers before submission, click the PREVIOUS button below. When you are ready to submit your answers, click DONE and your answers will be recorded.

Appendix C

Itemized Likert-Scale Results, Pre-Program Group

New Environmental Paradigm Results (Questions from Appendix A)

	Strongly Agree	Mildly Agree	Unsure	Mildly Disagree	Strongly Disagree
We are approaching the limit of the number of people the Earth can support.*	18.2%	45.5%	23.6%	10.9%	1.8%
Humans have the right to modify the natural environment to suit their needs.	3.6%	25.5%	12.7%	47.3%	10.9%
When humans interfere with nature it often produces disastrous consequences.*	32.1%	46.4%	10.7%	8.9%	1.8%
Human ingenuity will insure that we do NOT make the earth unlivable.	8.9%	28.6%	32.1%	21.4%	8.9%
Humans are severely abusing the environment.*	48.2%	33.9%	7.1%	10.7%	0.0%
The earth has plenty of natural resources if we just learn how to develop them.	30.4%	42.9%	17.9%	5.4%	3.6%
Plants and animals have as much right as humans to exist.*	58.9%	21.4%	7.1%	12.5%	0.0%
The balance of nature is strong enough to cope with the impacts of modern industrial nations.	7.1%	7.1%	12.5%	51.8%	21.4%
Despite our special abilities humans are still subject to the laws of nature.*	61.8%	29.1%	7.3%	1.8%	0.0%
The so-called "ecological crisis" facing humankind has been greatly exaggerated.	7.1%	10.7%	23.2%	35.7%	23.2%
The earth is like a spaceship with very limited room and resources.*	19.6%	37.5%	21.4%	16.1%	5.4%
Humans were meant to rule over the rest of nature.	8.9%	8.9%	19.6%	30.4%	32.1%
The balance of nature is very delicate and easily upset.*	19.6%	39.3%	14.3%	26.8%	0.0%
Humans will eventually learn enough about how nature works to be able to control it.	1.8%	17.9%	21.4%	39.3%	19.6%
If things continue on their present course, we will soon experience a major ecological catastrophe.*	37.5%	30.4%	25.0%	7.1%	0.0%
* - These items were reverse coded.					

Behavioral Results (Questions from Appendix A)

	Always	Frequently	Sometimes	Rarely	Never
I recycle bottles, cans and paper even when it is not convenient to do so.	37.5%	39.3%	19.6%	3.6%	0.0%
I buy biodegradable and recycled products whenever possible.	14.3%	32.1%	37.5%	16.1%	0.0%
I choose products with minimal packaging material whenever possible.	10.7%	30.4%	33.9%	21.4%	3.6%
Whenever possible, I buy foods that are produced in an environmentally friendly manner.	12.5%	39.3%	30.4%	14.3%	3.6%
I try to limit the amount of time I spend in the shower to conserve water.	17.9%	23.2%	26.8%	21.4%	10.7%
All items were reverse coded.					

Leave No Trace Results (Questions from Appendix A)

	Definitely True	Probably True	Probably False	Definitely False	I'm not sure
Some of the most attractive places to camp can be easily damaged by campers.*	53.6%	42.9%	0.0%	0.0%	3.6%
It is OK to camp close to another group in the wilderness.	5.4%	30.4%	30.4%	12.5%	21.4%
If people want a campfire and there isn't a fire ring present, they should gather some rocks and build one.	26.8%	26.8%	17.9%	16.1%	12.5%
It is OK to feed human food to wildlife.	0.0%	1.9%	20.4%	77.8%	0.0%
The natural environment can be easily damaged by visitors.*	71.4%	26.8	0.0%	1.8%	0.0%
It's OK for campers to bury biodegradable food waste (like apple cores and orange peels).	21.4%	46.4%	16.1%	7.1%	8.9%
Collecting a few rocks or feathers as souvenirs of an outdoor visit is OK.	1.8%	33.9%	33.9%	19.6%	10.7%
Taking a shortcut from a trail is OK when someone is in a hurry.	5.4%	7.1%	35.7%	46.4%	5.4%
Park rangers should be able to limit the number of visitors to protect park resources.*	35.7%	44.6%	7.1%	1.8%	10.7%
People should have a right to camp on public land any time they want.	0.0%	14.3%	44.6%	25.0%	16.1%
* - These items were reverse coded.					

Appendix D

Itemized Likert Scale Results, Post-Program Questionnaire

Behavioral Results (Questions from Appendix B)

	Always	Frequently	Sometimes	Rarely	Never
I recycle bottles, cans and paper even when it is not convenient to do so.	20.9%	52.2%	20.9%	3.0%	3.0%
I buy biodegradable and recycled products whenever possible.	6.0%	19.4%	46.3%	23.9%	4.5%
I choose products with minimal packaging material whenever possible.	10.4%	17.9%	37.3%	29.9%	4.5%
Whenever possible, I buy foods that are produced in an environmentally friendly manner.	6.0%	22.4%	46.3%	19.4%	6.0%
I try to limit the amount of time I spend in the shower to conserve water.	13.4%	20.9%	38.8%	17.9%	9.0%
All items were reverse coded.					

Leave No Trace Results (Questions from Appendix B)

	Strongly Agree	Mildly Agree	Unsure	Mildly Disagree	Strongly Disagree
Selecting an attractive place to camp is more important to me than finding a durable campsite.	1.5%	14.9%	13.4%	43.3%	26.9%
It is OK to camp close to another group in the wilderness.	3.0%	22.4%	25.4%	34.3%	14.9%
If I want a campfire and there isn't a fire ring present, I should gather some rocks and build one.	11.9%	10.4%	7.5%	19.4%	50.7%
It is acceptable to feed wildlife human food.	3.0%	3.0%	0.0%	7.5%	86.6%
The natural environment is very fragile and easily degraded by visitor use.*	64.2%	23.9%	3.0%	3.0%	6.0%
I would postpone a trip to my favorite area if I thought my visit would be harmful to wildlife at that time.*	46.3%	28.4%	19.4%	3.0%	3.0%
Collecting a few rocks or feathers as souvenirs of my outdoor visit is OK.	1.5%	34.3%	19.4%	20.9%	23.9%
Cutting a switchback is OK, especially if I am in a hurry.	1.5%	7.5%	31.3%	23.9%	35.8%
Public land managers should be able to limit visitation to protect park resources.*	31.8%	45.5%	15.2%	6.1%	1.5%
I should have a right to camp on public land any time I want.	3.0%	11.9%	17.9%	44.8%	22.4%
* - These items were reverse coded.					

New Environmental Paradigm Results (Questions from Appendix B)

	Strongly Agree	Mildly Agree	Unsure	Mildly Disagree	Strongly Disagree
We are approaching the limit of the number of people the Earth can support.*	24.2%	45.5%	13.6%	13.6%	3.0%
Humans have the right to modify the natural environment to suit their needs.	0.0%	16.7%	13.6%	48.5%	21.2%
When humans interfere with nature it often produces disastrous consequences.*	33.3%	54.5%	3.0%	7.6%	1.5%
Human ingenuity will insure that we do NOT make the earth unlivable.	6.1%	22.7%	45.5%	21.2%	4.5%
Humans are severely abusing the environment.*	1.5%	6.1%	3.0%	45.5%	43.9%
The earth has plenty of natural resources if we just learn how to develop them.	21.2%	54.5%	9.1%	12.1%	3.0%
Plants and animals have as much right as humans to exist.*	65.2%	21.2%	6.1%	6.1%	1.5%
The balance of nature is strong enough to cope with the impacts of modern industrial nations.	3.0%	9.1%	19.7%	47.0%	21.2%
Despite our special abilities humans are still subject to the laws of nature.*	65.2%	25.8%	4.5%	3.0%	1.5%
The so-called "ecological crisis" facing humankind has been greatly exaggerated.	1.5%	10.6%	30.3%	42.4%	15.2%
The earth is like a spaceship with very limited room and resources.*	19.7%	47.0%	16.7%	12.1%	4.5%
Humans were meant to rule over the rest of nature.	6.1%	16.7%	16.7%	27.3%	33.3%
The balance of nature is very delicate and easily upset.*	36.4%	39.4%	10.6%	12.1%	1.5%
Humans will eventually learn enough about how nature works to be able to control it.	1.5%	16.7%	24.2%	36.4%	21.2%
If things continue on their present course, we will soon experience a major ecological catastrophe.*	33.3%	39.4%	19.7%	6.1%	1.5%
* - These items were reverse coded.					

Appendix E

IRB Exemption Certification

IRB#31273- ORION Environmental Attitudes Survey

Hartman, Sara <sjh246@psu.edu>

Wed, Jun 10, 2009 at 12:19 PM

To: "nmc5051@psu.edu" <nmc5051@psu.edu>

Cc: "susanne1@psu.edu" <susanne1@psu.edu>, "hzinn@psu.edu" <hzinn@psu.edu>

Hi Nick,

The Office for Research Protections (ORP) has reviewed the application for the research study noted in the subject line of this email and determined it to be exempt from IRB review. You may begin your research. This study qualifies under the following category(ies):

Category 1: Research conducted in established or commonly accepted educational settings, involving normal educational practices, such as (i) research on regular and special education instructional strategies, or (ii) research on the effectiveness of or the comparison among instructional techniques, curricula, or classroom management methods. [45 CFR 46.101(b)(1)]

Category 2: Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observations of public behavior unless: (i) information obtained is recorded in such a manner that human participants can be identified, directly or through identifiers linked to the participants; **and** (ii) any disclosure of the human participants' responses outside the research could reasonably place the participants at risk of criminal or civil liability or be damaging to the participants' financial standing, employability, or reputation. [45 CFR 46.101(b)(2)]

PLEASE NOTE THE FOLLOWING:

- Include your IRB number in any correspondence to the ORP.
- The principal investigator is responsible for determining and adhering to additional requirements established by any outside sponsors/funding sources.
- **Record Keeping**
 - The principal investigator is expected to maintain the original signed informed consent forms, if applicable, along with the research records for at least three (3) years after termination of the study.
 - This will be the only correspondence you will receive from our office regarding this exemption determination.

§ MAINTAIN A COPY OF THIS EMAIL FOR YOUR RECORDS.

- **Consent Document(s)**
 - The exempt consent form(s) will no longer be stamped with the approval/expiration dates.
 - The most recent consent form(s) that you sent in for review is the one that you are expected to use.
- **Follow-Up**
 - The Office for Research Protections will contact you in three (3) years to inquire if this study will be on-going.
 - If the study is completed within the three year period, the principal investigator may complete and submit a **Project Close-Out Report**. (<http://www.research.psu.edu/orp/areas/humans/applications/closeout.rtf>)

Revisions/Modifications

- Any changes or modifications to the study must be submitted to the Office for Research Protections on the *Modification Request Form - Exemption* available on our website:

<http://www.research.psu.edu/orp/areas/humans/applications/modrequest.rtf>

- **Modifications will not be accepted unless the Modification Request Form is included with the submission.**

Please do not hesitate to contact me if you have any questions or concerns.

Thank you,

Sara Hartman
Research Compliance Coordinator II
Office for Research Protections
The Pennsylvania State University
201 Kern Graduate Building, University Park, PA 16802

Telephone: 814-865-3696

The Office for Research Protections is moving to Innovation Park in June 2009. Please visit <http://www.research.psu.edu/orp/moving.asp> for more details!

VITA

Nicholas M. Clabbers

Nicholas M. Clabbers
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State College, PA 16801
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Education: Bachelor of Arts Degree in Political Science and Bachelor of Science Degree in Community, Environment and Development, Penn State University, Spring 2010
Minor in Recreation, Parks and Tourism Management
Honors in Recreation, Parks and Tourism Management
Thesis Title: The Effect of the ORION Program on Environmental Attitudes
Thesis Supervisor: Dr. Harry Zinn

Related Experience:

Backpacking Leader for Penn State's ORION Program
Supervisor: Susanne Dubrouillet
Summers, 2007-2009

Awards:

Dean's List
College of Liberal Arts Student Commendation
National Honors Society
Eagle Scout, BSA Troop 72

Presentations/Activities:

President (2009-2010) and Vice President (2008-2009) of the Penn State Outing Club
Vice President (2008-2009) and Secretary (2007-2008) of the Penn State Ski Club
Study Abroad, Summer 2008: New Zealand