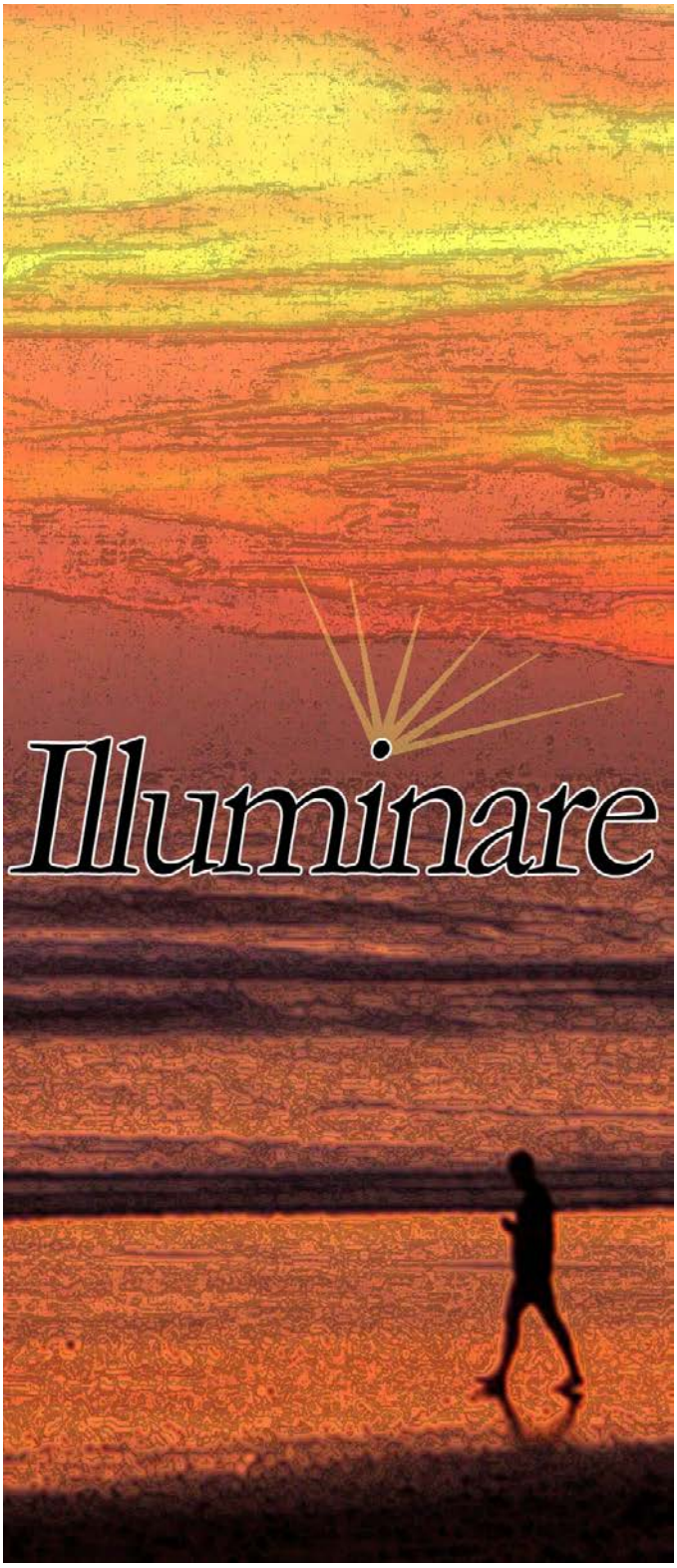

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Effects of the University of Georgia's Outdoor Adventure Activities Class on Students' Environmental Stewardship and Confidence within the Great Outdoors

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Effects of the University of Georgia's Outdoor Adventure Activities Class on Students' Environmental Stewardship and Confidence within the Great Outdoors

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Abstract

There is current concern that the younger generations of people in America have become, and are becoming, more disconnected and less exposed to natural resources in the great outdoors. This detachment from the natural world has resulted in the term 'nature deficit disorder' being used to describe this phenomenon (Louv, 2005). To help address this issue of nature deficit disorder, many school and summer programs have been developed to help reconnect and expose children to nature. However, while many school and summer programs have been shown to have a positive impact on children's environmental stewardship and confidence levels within the great outdoors, limited research has been conducted on university programs aimed at achieving the same goals. Hence, this exploratory study examined the effects of participation in the University of Georgia's Outdoor Adventure Activities Class (PEDB 1090) on participant's environmental stewardship and confidence levels within the great outdoors. A pre-post-test survey structure was used on the treatment group, which consisted of individuals who were participants in the class, and the control group, who were interested in the class but unable to join, in order to determine whether or not participating in the class altered environmental stewardship and confidence levels. In addition, reliability and validity tests were conducted on the survey instrument that was adapted from the New Environmental Paradigm scale to determine any altered levels of environmental stewardship or confidence. Overall, results suggested participation in the class did not have an effect on students' environmental stewardship, but did have a positive effect on students' levels of confidence within the great outdoors.

Keywords: outdoor recreation, environmental stewardship, personal confidence

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Introduction

There is current concern that the younger generations of people in America have become, and are becoming, more disconnected and less exposed to natural resources in the great outdoors (Louv, 2005). This detachment from the natural world has resulted in the term 'nature deficit disorder' being used to describe this phenomenon (Louv, 2005). Two specific traits that are exhibited as a direct result of nature deficit disorder are a lack of environmental stewardship and a lack of confidence in being in nature or a natural setting.

There is also some concern as to the implications that nature deficit disorder may have on the levels of future protection and support of our natural resources. Studies have indicated that a lack of exposure to nature during early years of growth and development may result in a lack of appreciation for and protection of natural resources in later years (Davis, 1998). This possible lack of nature appreciation is especially disconcerting when one is faced with the idea that the future stewards of our natural resources may actually care very little about them or their protection.

To help address this issue of nature deficit disorder, many school and summer programs have been developed to help reconnect and expose children to nature (Dettmann-Easler & Pease, 1999; Larson, Castleberry & Green, 2010; Negra & Manning, 1997). Research has shown these programs have a positive impact on increasing children's environmental stewardship and confidence levels in a natural resource setting (Davis, 1998; Dresner & Gill, 1994). Unfortunately, despite the growth of school and summer programs specifically intended to increase children's exposure to nature, many young adults, who have graduated past these programs and moved on to higher degrees of education have more limited opportunities in which to engage in outdoor activities or nature (Ballantyne, Fien & Packer, 2001; Negra & Manning, 1997).

However, some universities do offer outdoor recreation programs for students aimed at promoting environmental stewardship and confidence in the great outdoors. Although, unlike many school and summer programs that have been shown to have a positive impact on children's environmental stewardship and confidence levels within the great outdoors, limited research has been conducted on university programs aimed at building and fostering environmental stewardship and confidence levels within the great outdoors.

One such university that offers programs geared toward increasing students' environmental stewardship and confidence levels within a natural resource setting is the University of Georgia (UGA). At UGA, the Georgia Outdoor Recreation Program (GORP) is geared to "provide fun, hands-on instructional opportunities for beginners and novice participants to learn the skills and safety concerns for a wide variety of outdoor activities in a supervised environment" (GORP, 2011, p.2). Skills such as Leave No Trace Principles and teaching of wilderness medicine practices are just a few of the ways in which GORP activities bolster environmental stewardship and confidence levels within the great outdoors.

Purpose, Objectives & Justification

Many university-level outdoor recreation programs have not been adequately evaluated in terms of their possible impacts on students (Arnocky & Stroink, 2011; Breunig, O'Connell, Todd, Anderson, Young, 2010; Rabinowitz & Frauman, 2009). The University of Georgia offers many such programs, but they too, have not been adequately evaluated. This study investigated students' relationships with nature through GORP's Outdoor Adventure Activities Class (PEDB 1090). The specific objectives of this study were to: (1) design a reliable and valid survey instrument for measuring environmental stewardship and confidence levels; (2) examine the effect of participation in PEDB 1090 on students' environmental stewardship; and (3) examine the ef-

fect of participation in PEB 1090 on students' confidence levels within the great outdoors.

There is currently concern that a lack of exposure to nature will eventually lead to a lack of appreciation for and protection of natural resources in the future (Davis, 1998). Environmental education programs are helping to address this problem, but they are predominately aimed at younger children and hence these programs are more scarce in regards to older age groups. Some universities have outdoor recreation programs aimed at involving college-aged students, but very few studies have examined the possible effects of participation in such programs on older students (Arnocky & Stroink, 2011; Breunig et al., 2010; Rabinowitz & Frauman, 2009).

As people become more and more dependent on technology and less connected with nature, it is extremely important to offer as many opportunities to interact with the natural world as possible. This study represents an important step in the process of expanding and creating new opportunities for college-aged students. Results of this study could possibly be used to implement outdoor recreation programs for college-aged students in places where they do not already exist, as well as improve the content and potential impact of existing programs.

Literature Review

Nature deficit disorder is a term coined by Richard Louv in his book, *Last Child in the Woods*. Louv (2005) presents the idea that today's children are spending very limited time outside in natural settings, the result of which is disconnecting them from nature. This disconnect from nature is placing children at a disadvantage because of the documented benefits associated with children spending time in the great outdoors (Baum, 1999; Hansen-Ketchum, Marck & Reutter, 2009; Maller et al., 2009; McCurdy, Winterbottom, Mehta & Roberts, 2010; Ulrich, 1993). For instance, studies have shown children who interact with nature often benefit from improved cognitive functioning, enhanced stress management skills, accelerated recovery from illness and a greater sense of community belonging (Baum, 1999; Hansen-Ketchum et al., 2009; Maller et al., 2009). Increased physical activity due to interactions in a natural setting have also been shown to reduce blood pressure, increase cardio-respiratory fitness levels, decrease the body mass index and improve mental health conditions (McCurdy et al., 2010; Ulrich, 1993).

Conversely, children who spend less time outdoors and lead a more sedentary lifestyle often experience increased health problems such as attention deficit hyperactivity disorder (ADHD), asthma and childhood obesity (McCurdy et al., 2010). These health problems may often persist into adulthood and lead to more pressing problems such as cardiovascular, pulmonary and mental health issues (McCurdy et al., 2010). Research further suggests these sedentary children may be the first generation to have a shorter lifespan than their parents (McCurdy et al., 2010). However, maladies such as depression, anxiety and ADHD have been shown to improve with interactions in nature, with the idea "nature can restore the mental fatigue that occurs after prolonged concentration" (McCurdy et al., 2010, p.109). Additionally, the American Academy of Pediatrics (2006) recommends children spend as much time outdoors as possible to increase health benefits.

Louv (2005) ascribes this disparity between children and nature to the current and growing indoor lifestyle so many children receive today. Children may be so focused on, or in some cases obsessed with, electronic forms of entertainment that they have no interest in the great outdoors or their natural surroundings. To compound this issue, parents often worry about the potential threats of "stranger-danger," becoming lost in the outdoors or threats from wildlife. Movies, books and video games also perpetuate this stereotype that the natural environment is a dangerous place that children should avoid.

Likewise, half of the fifth and seventh graders in Georgia lack healthy cardiovascular levels and only 35% of high school students meet recommended physical activity levels. Studies also indicate children with overweight parents are at more than double the risk of becoming obese (Agras, Hammer, McNicholas & Kraemer, 2004; McCurdy et al., 2010). Furthermore, increased marketing of electronics to children as young as nine months, greater access to electronic media and the loss of free play for children only continues to add to the health problems of children (McCurdy et al., 2010) as well as reducing children's environmental stewardship.

At the present time, there is some concern that a lack of exposure to the outdoors at a young age will result in a lack of appreciation for and protection of natural resources in later years. For instance, Palmberg and Kuru (2000) found children enrolled in environmental education classes had a more developed feeling of self-confidence and safety and a willingness to continue to participate in outdoor activities than a control group, which had no exposure to environmental education. Additionally, when children in the control group were asked how they could help the environment many had difficulty coming up with possible solutions. A few children even stated they did not want to help the environment, and admitted to littering, even after being provided with educational materials (Palmberg & Kuru, 2000).

Palmberg and Kuru's (2000) findings are especially disconcerting because the children that admitted to defacing the environment, even after the presentation of environmental literature, may well be the generation responsible for protecting it in the future. If this implied cycle of disregard for nature continues, the children littering today may very well have little or no affinity for preserving or protecting our natural resources in the future, as studies have suggested that childhood involvement in the natural world may have a positive effect on adult environmentalism (Wells & Lekies, 2006). This possible decline of environmental stewardship in future generations is why a continued, structured environmental education system, present throughout childhood and youth is deemed necessary.

Research has suggested regular participation in environmental education programs may have a positive effect on the future civic involvement of children (Boss, 1999). Outdoor education programs consisting of components such as adventure education and service learning have been shown to have a positive impact on individuals' sense of community service and political activism (Boss, 1999). A sense of community service and political activism may be extremely important in preserving and protecting our natural areas in the near future.

Hence, with many children at risk of being categorized with nature deficit disorder, and others holding very little regard for natural areas, schools and counties have begun to offer after school and summer programs aimed at encouraging children to spend more time outdoors in nature. Many of these environmental education programs have resulted in an improvement in environmental stewardship and confidence levels in natural settings in children (Neill, 2002). Additional benefits accrued from these programs also include increases in leadership (decision making, time management, goals), academic skills (problem solving, reading), personality (reduced aggression, assertiveness, maturity), and interpersonal skills (cooperation, social competence) (Neill, 2002). Outdoor activities and programs also foster a sense of sensitivity toward the environment, and environmental stewardship is best nurtured in the outdoors (Yerkes & Haras, 1997). If children are learning practices such as environmental sensitivity and becoming environmentally responsible, they may more likely seek to act on behalf of the environment in a positive manner.

With various documented benefits of interactions in natural settings, it is interesting that few studies have been done at the college level to address whether young adults are as affected by environmental exposure as children appear to be. Vari-

ous studies have been done to determine risk-behavior in regards to outdoor recreation, the sense of community felt from recreational pursuits, as well as the effects of environmentalism in regards to studying and majoring in outdoor topics, but there is still a lack of available information pertaining to the effect(s) that the casual pursuit of outdoor recreation may have on college-aged students (Arnocky & Stroink, 2011; Breunig et al., 2010; Rabinowitz & Frauman 2009).

Methodology

This study was conducted with a treatment and control group using a pre-post-test survey structure. The treatment group consisted of students at the University of Georgia who were in enrolled in GORP's Outdoor Adventure Activities Class (PEDB 1090) and were required to participate in twenty-five hours of GORP activities over the course of the Fall 2010 Semester or Spring 2011 Semester. The control group consisted of college students who were not enrolled in the PEDB 1090 class. These students had expressed an interest in participating in such a class, but the PEDB 1090 course in question was at capacity for enrollment. The treatment group was given the pre- and post-test surveys at both the beginning and end of the Fall 2010 Semester or Spring 2011 Semester. Because the sample size of the first treatment group was less than thirty participants, pre- and post-test surveys were given to the next group of students enrolled in PEDB 1090, which took place during the Spring 2011 Semester (Vaske, 2008). Both PEDB 1090 classes used in this study were identical in instructors, nature, length and content. The control group was given the pre- and post-test surveys at the beginning and end of the Fall 2010 Semester.

The purpose of this study was to examine the effects of the GORP Outdoor Adventure Activities Class (treatment) on students' environmental stewardship and confidence levels within the great outdoors. This study was guided by a pre-post-test design that compared students enrolled in PEDB 1090 (the treatment group) to students not enrolled in the class (the control group), focusing on the following objectives and hypotheses:

Objective I

To construct and validate a survey (PEDB 1090 – Outdoor Adventure Activities Survey) that measures students' environmental stewardship and confidence levels within the great outdoors.

Alternate Hypothesis (H_{1a}): Analyses will provide statistically significant evidence supporting the validity and reliability of the PEDB 1090 – Outdoor Adventure Activities Survey in terms of it measuring students' environmental stewardship and confidence levels within the great outdoors.

Objective II

To examine the effect of the GORP PEDB 1090 – Outdoor Adventure Activities Class on students' environmental stewardship.

Alternate Hypothesis (H_{2a}): Analyses will provide statistically significant differences in levels of environmental stewardship between students in the treatment and control groups.

Objective III

To examine the effect of the GORP PEDB 1090 – Outdoor Adventure Activities Class on students' confidence levels within the great outdoors.

Alternate Hypothesis (H_{3a}): Analyses will provide statistically significant differences in confidence levels within the great outdoors between students in the treatment and control groups.

This study used treatment (n = 45) and control (n = 33) groups of students at the University of Georgia that were either enrolled in PEDB 1090, or had expressed interest in the class, but were not able to participate. Table 1 provides the socio-demographic characteristics of students in both the treatment and control groups.

This study used a purposeful sample in that participants were only drawn from students participating in, or had expressed an interest in the PEDB 1090 class. When collecting the data for the treatment group, all students in the PEDB 1090 class

Table 1: ***Socio-demographic Characteristics of Students in the Treatment and Control Groups***

Variable		Treatment Group (n / %)	Control Group (n / %)
Gender	Female	33 / 73.33 %	22 / 66.67 %
	Male	12 / 26.67 %	11 / 33.33 %
Year in School	1st	6 / 13.33 %	0 / 0.00 %
	2nd	3 / 6.67 %	0 / 0.00 %
	3rd	6 / 13.33 %	3 / 9.09 %
	4th	23 / 51.11 %	6 / 18.18 %
	Other	7 / 15.56 %	24 / 72.73 %
Age	18-19 years	9 / 20.00 %	0 / 0.00 %
	20-21 years	14 / 31.12 %	3 / 9.09 %
	22-23 years	20 / 44.44 %	22 / 66.67 %
	24-25 years	0 / 0.00 %	5 / 15.15 %
	26 + years	2 / 4.44 %	3 / 9.09 %
Ethnicity	White/ Caucasian	35 / 77.78 %	19 / 57.58 %
	Hispanic/ Latino	4 / 8.89 %	1 / 3.03 %
	Black/ African American	0 / 0.00 %	6 / 18.18 %
	Asian	4 / 8.89 %	0 / 0.00 %
	American Indian	0 / 0.00 %	0 / 0.00 %
	Other	2 / 4.44 %	7 / 21.21 %

were asked to voluntarily participate in the study by signing a consent form and completing the PEDB 1090 – Outdoor Adventure Activities Survey. All students in PEDB 1090 voluntarily registered for the class before the survey was administered; hence randomization of students participating in the class was not possible. When collecting the data for the control group, an identical copy of the PEDB 1090 – Outdoor Adventure Activities Survey was transcribed into an online format, and participants were emailed a link and asked to complete the consent form and survey. Control group participants, as previously mentioned, were contacted based on their interest in participating in PEDB 1090.

Prior to creating the survey for data collection, a thorough review of existing literature pertaining to environmental stewardship and confidence levels within the great outdoors was conducted. From this review, questions and scales from previous studies were incorporated as part of this survey instrument. Environmental stewardship and confidence levels within the great outdoors were measured using a survey consisting of twenty-nine total items: one multiple-answer activity question, twenty-four statements with five-point Likert-type responses and four questions about demographics.

The multiple-answer question was directly related to the specific activities the GORP program offered to its participants and was used to determine the type of outdoor activity each person participated in (GORP, 2011). A record of each activity was taken because different GORP activities have different levels of environmental education. For example, a student may learn more about Leave No Trace Principles on a backpacking trip than they may during a sailing clinic. Both activities offer environmental education and attempt to foster environmental stewardship, but some may be more effective than others due to their setting and duration. This is also an area where there could be improvement in training of trip leaders – if the leaders know to emphasize environmental stewardship, participants may learn more.

The Likert response statements were split into two groups of twelve statements. The first twelve statements were designed to measure students' confidence levels within the great outdoors. Students' confidence levels within the great outdoors were also divided into three sub-constructs, which were

students' interactions with other people, perceptions of the outdoors and confidence in their outdoors skill sets. The statements pertaining to confidence levels within the great outdoors were adapted from the 2010 National Survey on Recreation and the Environment, which has shown to be valid and reliable in measuring respondents' participation in outdoor recreation(See Table 3 for Confidence Statements) (NSRE, 2010).

The second group of twelve Likert response statements was designed using the New Environmental Paradigm (NEP) and assessed environmental stewardship by determining whether participants were pro- or anti-NEP (Dunlap & Van Liere, 1978). The NEP measures how people perceive the natural world (i.e., - people's attitudes towards environmental protection, population control and limited industrial growth) (Pelstring, 1997). Concurrence or contest with the NEP statements indicates acceptance or rejection of the NEP (See Table 3 for NEP Statements).

The twelve statements that measured students' confidence levels within the great outdoors and the twelve statements that measured students' environmental stewardship were randomly arranged, and respondents were asked whether they thought the statements were 1 = "Not True," 2 = "Slightly Not True," 3 = "Neither," 4 = "Slightly True," 5 = "Very True" (Dunlap & Van Liere, 1978).

The final section contained socio-demographics questions that captured information about students' college level, gender, age and race/ethnicity. These questions were based on those used by the U.S. Census (2010) and were recorded to examine differences in environmental stewardship and confidence levels within the great outdoors between demographic strata.

Limitations

Due to the time constraints of this study, no pilot testing of the PEDB 1090 – Outdoor Adventure Activities Survey was possible; however the survey was modeled after existing and established scales and questions to increase validity and reliability of data obtained. This study used a purposeful sample (i.e., participants who were or who had expressed an interest in the PEDB 1090 class), with a low enrollment population, so no randomization was employed during selection of the subjects for either group. Hence, results from this study cannot be generalized to the main student population (Vaske, 2008).

Additionally, the treatment group received a paper copy of the PEDB 1090 – Outdoor Adventure Activities Survey, which was administered during their scheduled class time, while the control group took the survey online, although they were able to save or print a copy of the survey itself. Despite the fact the treatment and control groups received identical surveys the lack of uniformity in subjects receiving the survey is a limitation of this study (Vaske, 2008). The control group was also given an online version of the survey due to time constraints.

Another possible limitation is that participants in the study may have had an inherent interest in a class such as PEDB 1090, and thus may have already had higher environmental stewardship and confidence levels within the great outdoors than persons who were not interested in participating in such activities. Furthermore, none of the control group participants were active in any GORP activity during the course of this study, and their participation in outdoor recreation outside of scheduled GORP activities was unknown.

Finally, in creating the Likert response statements to determine the effect of the PEDB 1090 class on students' environmental stewardship, Dunlap's 1978 NEP statements were used, as opposed to the more recent New Ecological Paradigm, which is a revision of the older NEP scale (Dunlap, Van Liere, Mertig & Jones, 2000). The older version of NEP statements was used because they have been shown to have well established reliability and validity for measuring environmental stewardship (Albrecht, 1982; Tarrant & Cordell, 1997; Wiidegren, 1998).

Data Analysis

Data analysis was conducted using the PASW Statistics Program, Version 18.0. To determine the reliability of the survey questions, Cronbach's Alpha tests were conducted on all Likert response statements. Paired T-tests were used to evaluate any statistically significant differences in pre-test and post-test responses, with p values less than 0.05 being considered significant. An analysis of variance (ANOVA) was used to analyze differences between the gain means (post-test minus pre-test) of the treatment and control groups.

Results

Reliability of the PEDB 1090 – Outdoor Adventure Activities Survey

Data for PEDB 1090 – Outdoor Adventure Activities Survey were examined to assess the reliability of the survey questions using Cronbach's Alpha. Overall Cronbach's Alpha for the entire twenty-four Likert response statements was 0.737. Cronbach's Alpha for the twelve Likert response statements that measured environmental stewardship totaled 0.770. The two sub-constructs of pro- or anti-NEP were 0.769 and 0.565, respectively. Cronbach's Alpha for the twelve Likert response statements that measured confidence levels within the great outdoors was 0.859. The three sub-constructs of confidence levels within the great outdoors (i.e., interactions with other people, in the outdoors and skill sets) were 0.528, 0.836 and 0.887, respectively (see Table 2).

Using T-tests to Compare Treatment and Control Groups

When investigating effects of PEDB 1090, paired T-tests were used to examine any significant differences in the scores (post-test minus pre-test) on specific items across the various sub-constructs for individuals in the treatment and control groups. For the control group, none of the pro- or anti-NEP statements showed any statistically significant difference between the pre- and post-test survey scores. In fact, the lowest p-value that either sub-construct obtained was 0.110, with the statement "Mankind is severely abusing the environment." When examining the sub-constructs that measured confidence within the great outdoors, only one statement showed any statistically significant difference ($p \leq 0.039$) "I DO NOT feel confident being in the forest."

Table 2: ***Results of Cronbach's Alpha Analysis on the Pre-Test of the PEDB 1090 – Outdoor Adventure Activities Survey***

Pre Test	Number of Items	Cronbach 's Alpha
Total	**24**	**0.737**
All NEP Statements	**12**	**0.770**
Pro NEP Statements	8	0.769
Anti NEP Statements	4	0.565
All Confidence Statements	**12**	**0.859**
People	4	0.582
Outdoors	4	0.836
Skills	4	0.887

Statistically significant differences were found between the pre- and post-tests survey scores of the treatment group (see Table 3). Statements are organized in Table 3 by sub-construct for easier comprehension. Three statements within the environmental stewardship construct had statistically significant differences: "The balance of nature is very delicate and easily upset" (sig. 0.001); "To maintain a healthy economy we will have to develop a 'steady state' economy where industrial growth is controlled" (sig. 0.050); "Humans have the right to modify the natural environment" (sig. 0.023). Furthermore, eight of the twelve statements pertaining to confidence levels within the great outdoors did have statistically significant differences, indicating participation in the PEDB 1090 class positively affected students' confidence levels (see Table 3).

Table 3: ***Significance Levels of Paired T-test for the Twenty-Four Likert Response Statements for the Treatment Group***[1]

Item	Mean Difference (Post-Pre)	t	df	Sig. (2-tailed)
Environmental Stewardship: Pro-NEP				
We are approaching the limit of the number of people the earth can support.	0.044	0.286	44	0.776
The balance of nature is very delicate and easily upset.	0.378	3.538	44	0.001
When humans interfere with nature it often produces disastrous consequences.	0.044	0.374	44	0.710
To maintain a healthy economy we will have to develop a "steady state" economy where industrial growth is controlled.	0.267	2.011	44	0.050
Humans must live in harmony with nature in order to survive.	0.000	0.000	44	1.000
The earth is like a spaceship with only limited room and resources.	0.222	1.461	44	0.151
There are limits to growth beyond which our industrialized society cannot expand.	0.289	1.482	44	0.145
Mankind is severely abusing the environment.	-0.022	-0.167	44	0.868
Environmental Stewardship: Anti-NEP				
Humans have the right to modify the natural environment.	0.400	2.362	44	0.023
Humankind was created to rule over the rest of nature.	0.200	1.545	44	0.130
Plants and animals exist primarily to be used by humans.	-0.133	-0.829	44	0.411
Humans need not adapt to the natural environment because they can remake it to suit their needs.	-0.089	-0.530	44	0.599
Confidence Levels: Interactions with Other People				
I do NOT feel confident being in the woods with other people.	0.156	1.479	44	0.146
I feel comfortable with meeting other people.	0.533	4.000	44	0.000
I feel confident being in the woods with other people.	0.267	1.574	44	0.123
I feel uncomfortable around other people.	-0.044	-0.189	44	0.851
Confidence Levels: In the Great Outdoors				
I feel confident being in the forest.	0.400	3.728	44	0.001
I do NOT feel safe in the outdoors.	0.333	3.317	44	0.002
I do NOT feel confident being in the forest.	0.267	1.956	44	0.057

Item	Mean Difference (Post-Pre)	t	df	Sig. (2-tailed)
I feel safe in the outdoors.	0.422	4.313	44	0.000
Confidence Levels: Skill Sets				
I feel confident in my outdoor skills.	0.711	6.563	44	0.000
I feel confident teaching others outdoor skills.	1.133	8.268	44	0.000
I do NOT feel confident in teaching others outdoor skills.	0.800	4.342	44	0.000
I do NOT feel confident in my outdoor skills.	0.444	3.084	44	0.004

[1] The Likert-response statements have been reorganized to facilitate a clearer understanding of the results.

Of these eight, the most statistically significant differences were for the sub-constructs of confidence in the great outdoors and confidence in skill sets.

Using ANOVA Tests to Compare the Sub-Constructs

An analysis of variance (ANOVA) was conducted on the five different sub-constructs to determine if any differences existed between the control and treatment group. To compare sub-constructs, the mean answer for each pre- and post-test sub-construct was first generated for each participant. Differences between the pre- and post-test sub-construct mean scores were then created to find a gain mean. Finding the gain mean shows for all subjects, whether the post-test was higher than the pre-test (indicated by a positive score), or had no major change. Again, no statistically significant difference was found for the construct of environmental stewardship; however this test revealed each sub-construct for determining confidence levels within the great outdoors was statistically significant (see Table 4).

Table 4: ***ANOVA Test Results for the Gain Means of Each Sub-Construct***

Gain Mean Sub-Construct	Mean Square	df	F	Sig.
Pro-NEP	0.513	1	2.534	0.116
Anti-NEP	0.333	1	0.959	0.331
People	2.524	1	7.109	0.009
Outdoors	3.925	1	15.158	0.000
Skills	11.803	1	27.105	0.000

Discussion

This study was designed to determine the effects of participation in the GORP Outdoor Adventure Activities Class (PEDB 1090) on environmental stewardship and confidence levels within the great outdoors. The three-step process to determine the effects involved: (1) construction and validation of the PEDB 1090 – Outdoor Adventure Activities Survey used to measure students' environmental stewardship and confidence levels within the great outdoors; (2) examining the effect of the PEDB 1090 class on students' environmental stewardship; and (3) examining the effect of the PEDB 1090 class on students' confidence levels within the great out doors. A discussion of results for this study is described below.

Constructing the Survey Instrument

Before constructing the survey instrument, a thorough literature review pertaining to the subjects of environmental stewardship and confidence levels within the great outdoors was conducted. From this

study, questions were formulated to directly capture students' environmental stewardship and confidence levels within the great outdoors before and after participating in the PEDB 1090 class.

Pilot testing of the PEDB 1090 – Outdoor Adventure Activities Survey was not possible due to the time constraints of this project. If more time was available, pilot testing of the survey would be recommended to ensure all participants fully understood the nature of the survey statements. Cronbach's Alpha scores were conducted for the entire twenty-four Likert response statements to determine reliability of the survey questions, and were high at 0.737. The sub-constructs with the lowest Cronbach's Alpha levels were those measuring anti-NEP sentiments (0.565) and confidence in working with other people (0.528), indicating the least amount of understanding with those subjects. Had pilot testing been implemented, items may have been adjusted to help increase participant understanding of these items.

Examining the Effect of PEDB 1090 on Students' Environmental Stewardship

The Likert response statements used in the PEDB 1090 – Outdoor Adventure Activities Survey to measure environmental stewardship were taken directly from the New Environmental Paradigm (Dunlap & Van Liere, 1978). While these NEP statements have been shown to have well established reliability and validity for measuring environmental stewardship (Albrecht, 1982; Tarrant & Cordell, 1997; Wiidegren, 1998), they were not statistically significant for the majority of questions in this study. For the control group, none of the statements measuring environmental stewardship (either pro- or anti-NEP) showed any level of significance. For the treatment group, only three of the Likert response statements pertaining to environmental stewardship showed any significance. These statements were: (1) "The balance of nature is very delicate and easily upset;" (2) "To maintain a healthy economy we will have to develop a 'steady state' economy where industrial growth is controlled;" and (3) "Humans have the right to modify the natural environment."

Even though past studies have indicated that outdoor recreation increases environmental stewardship (Davis, 1998; Dresner & Gill, 1994), the mission statement of the GORP program does not include fostering environmental stewardship, but rather their main goal is to teach new skills to beginners (GORP, 2011). This lack of introducing concepts of environmental stewardship to participants as part of its mission statement, and the lack of a significant statistical finding through the survey, could indicate that concepts of environmental stewardship are indeed not being transferred from trip leader to participants. Participants simply are not receiving enough education about environmental stewardship through participation in GORP programs to have any significant statistical impact on them.

Examining the Effect of PEDB 1090 on Students' Confidence Levels within the Great Outdoors

The Likert response statements were directed at capturing students' confidence levels within the great outdoors were modeled after the 2010 National Survey on Recreation and the Environment (NSRE, 2010). The responses gathered from these statements showed a higher statistical significance difference than those collected from the statements on environmental stewardship. For the treatment group, eight of the twelve statements showed statistical significance differences, indicating participation in the PEDB 1090 class may in fact have had a positive effect on confidence levels within the great outdoors. Additionally, when ANOVA tests were conducted, the same sub-constructs again showed statistical significance differences.

The GORP programs are directed at teaching skills and safety concerns to their participants through hand-on instruction from a trained trip leader (GORP, 2011). Because the main goal of the GORP program is to introduce beginners to new activities, it is logical the treatment group saw a positive increase in their confidence levels scores within

the great outdoors between the pre- and post-test surveys. This statistical significance indicates the GORP trip leaders are indeed achieving the program's goal of teaching new skills, which brings about confidence in outdoor activities.

Conclusions

Published literature and studies have indicated participation in outdoor recreation has multiple benefits, including those related to health, mental well-being and greater civic involvement (Baum, 1999; Hansen-Ketchum et al., 2009; Maller et al., 2009; McCurdy et al., 2010; Ulrich, 1993). However, a basic problem young adults are facing today is a lack of outdoor recreation programs directed at people in the college level and beyond, who have graduated from younger environmental education programs. The University of Georgia is one such program that offers outdoor recreation opportunities to college-age adults, and the purpose of this study was to examine effects of GORP's Outdoor Adventure Activities Class (PEDB 1090) on students' environmental stewardship and confidence levels within the great outdoors. This study found that, while there was no statistical significance difference related to the impact the GORP program had on students' environmental stewardship, it did indicate participation in the GORP program did have a positive effect on students' confidence levels within the great outdoors.

This study's findings did agree with previous research indicating participation in outdoor recreation had a positive effect on confidence levels within the great outdoors (Davis, 1998; Dresner & Gill, 1994), but failed to find participation in outdoor recreation had a positive effect on participants' environmental stewardship. Clearly, there are positive personal benefits that participants in outdoor recreation receive, but more in-depth studies need to be conducted to determine the scope of these benefits, and how they may affect participants in the future. Additionally, if the GORP program intends for participants to have increased environmental stewardship after participating in a GORP activity, then re-training of trip leaders and re-structuring of the program needs to take place to ensure participants are being appropriately exposed to ideas about environmental stewardship.

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