

The Effects of In-Depth Outdoor Experience on Attitudes toward Nature

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The purpose of this study was to examine the effects of in-depth outdoor experience on participants' attitudes toward nature. The author developed a scale of attitudes toward nature, measuring four factors: pro-environment, positive affect, camp, and environmental ethic. A wilderness experience questionnaire covering six aspects, namely oneness, timelessness, primitiveness, humility, solitude, and care (Borrie, 1995), was administered each day to 44 students in grades 4-11 who attended an 8-day camp in order to measure the degree to which they perceive nature. The scale of attitudes toward nature was administered four times during the camp: at the beginning, before a backcountry hiking trip, after the trip, and at the end of camp. Covariance analysis revealed that the group that had a deeper outdoor experience showed a significant increase in positive attitudes toward nature compared with a less deeply experienced group.

KEYWORDS: wilderness experience, wilderness attitude, expedition, organized camp

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Many researchers have studied the effects of outdoor education programs. In recent years, research has determined the factors that contribute to participants' development, as well as examined the effects of the program. For example, program length (Bogner, 1998; Shepard & Speelman, 1986), pre- and post-visit activities (Smith-Sebasto & Cavern, 2006), and actively engaging visiting teachers in on-site instruction (Stern, Powell, & Ardoine, 2008) have been verified as factors that affect participants' environmental attitudes. Although directors and researchers can control certain factors such as activities, environments, instructors, and participant groups, they may not be able to control how participants feel and perceive the experience. Even when participants engage in the same activities and environments, what each person feels and perceives will be different. Therefore, outdoor education research field needs to not only examine the causal relationship between such factors and their effects, but also consider how participants perceive the experience.

How participants perceive nature in outdoor education is a meaningful research question worth exploring. Although outdoor experience clearly improves participants' attitude toward nature, the causal relationship between the two has not been thoroughly examined, and should be discussed further. For example, the relationship between the depth of outdoor experience (the degree to which participants perceive nature) and the effects of outdoor education need further research and will make a worthwhile contribution to the literature.

A concept similar to the depth of outdoor experience has been examined in previous leisure research. Borrie (1995) developed the Wilderness Experience Scale (WES), which consists of six aspects: *oneness, timelessness, primitiveness, humility, solitude, and care*. This scale measures a person's wilderness experience by quantifying his/her perceptions and feelings toward the wilderness. This scale can be adapted to measure the degree to which participants perceive nature. McIntyre (1998), and Borrie and Roggenbuck (2001) used this scale to measure canoeists' wilderness experiences during outdoor trips. However, they did not focus on the relationship between wilderness experience and psychological effects. To date, no one has examined the relationship between outdoor experience and attitudes toward nature by measuring the depth of outdoor experience.

The purpose of this study was to experimentally identify new indicators that affect attitudes toward nature. In particular, depth of outdoor experience and the effects on participants' attitudes toward nature were the main focuses of this study. Clarifying the relationship between in-depth outdoor experiences and the resulting attitude changes would be very beneficial. This study aimed to ascertain how depth of outdoor experience is meaningful to participants in order to better understand the factors that affect attitudes toward nature.

Literature Review

Depth of Outdoor Experience

Previous studies have described the term *outdoor experience* in various ways. Even though the meanings of outdoor experience were varied, interrelated, and hard to describe (Loefler, 2004), many researchers have stated its necessity. For example, it has been demonstrated that outdoor experience is the most important contributor to positive environmental attitudes and behavior (Chawla, 1999; Ewert, Place, & Sibthorp, 2005; Palmer & Suggate, 1996; Sward, 1999). Outdoor experience is a very important aspect of outdoor education, yet few studies have focused on the depth of outdoor experience and measured the degree to which participants perceive nature.

One of the most suitable scales for measuring the degree to which a person perceives nature is the WES (Borrie, 1995). Borrie conducted research to infer what constitutes a wilderness experience, and then categorized six aspects: oneness, timelessness, primitiveness, humility, solitude, and care. Borrie then examined 62 visitors at the Okefenokee National Wildlife Refuge using the experience sampling method (ESM) to understand how a person's wilderness experience changes through a canoeing trip. To further understand wilderness experience, McIntyre (1998) examined 13 canoeists using ESM and a modified WES composed of five aspects: oneness, timelessness, primitiveness, solitude, and care. The results indicated that wilderness experience was enriched more through nature-based activities and active outdoor pursuits than through maintenance activities around the campground. Using factor analysis, Borrie and Roggenbuck (2001) re-categorized the WES into four aspects: oneness/primitiveness/humility, timelessness, solitude, and care. They found that oneness/primitiveness/humility was higher in both the immersion and exit phases of a canoe trip than in the entry phase, and care was higher in the exit phase than in the entry phase. In this way, the WES has made quantifying the degree to which one perceives wilderness and nature possible. To date, wilderness experience research has indicated that the concept of solitude is an essential factor (Borrie, 1995; Cole & Hall, 2009; Heintzman, 2003). Some research has also indicated that the feelings of oneness with and closeness to the natural environment are very important for a positive wilderness experience (Borrie & Roggenbuck, 2001; Talbot & Kaplan, 1986). Loeffler (2004) investigated the meaning of outdoor experience and stated that senses of awe, mystery, beauty, tranquility, solitude, and peace brought about positive outdoor experiences. These elements encourage a person to perceive the depth of nature. Hence, senses of solitude, oneness, awe, and so on are important elements for a high-quality, in-depth outdoor experience.

Outdoor Wilderness Programs and Attitudes toward Nature

Previous studies have been conducted in order to understand the effects of outdoor wilderness programs on attitudes toward nature/wilderness. For example, Hanna (1995) compared the benefits of an outdoor adventure program (Outward Bound) and a field ecology program (Audubon). While Audubon participants showed more outdoor recreational and pro-environmental tendencies than the Outward Bound participants, one group of Outward Bound participants exhibited the most significant gains in eco-centric attitudes toward the wilderness. Hanna suggested that physical and affective adventure-education programs had substantial impacts on the participants. Bogner (1998) investigated the influences of an outdoor ecology program on students' attitudes toward conservation and nature. The study's pre-and post-test design showed that both one- and five-day programs improved their attitudes. Kellert and Derr (1998) integrated retrospective and longitudinal methods in a study of participants of the Student Conservation Association (SCA), National Outdoor Leadership School (NOLS), and Outward Bound (OB) programs in order to understand the impacts of outdoor wilderness experience. Kellert and Derr reported that the outdoor wilderness experience greatly affected participants' attitudes toward nature, and that they retained these attitudes for half a year. Haluza-Delay (2001) investigated eight participants' experience on a 12-day adventure trip through observation and post-trip interviews. The results revealed that the participants conceived of nature as undisturbed, without people, relaxed, and free. Interestingly, they viewed nature as being "out there", different and removed from their home environment, and felt that nature does not exist at home. Haluza-Delay concluded that this construction of nature diminished their motivation to take care of their home environments. Haluza-Delay also underlined the need for wilderness programs that are more oriented to helping participants clearly understand the connections among humans, nature, and the local environment. Yoshino (2005) examined the effects of wilderness-based programs, and

compared a long-term (three-week) program with a short-term (five-day) program. The short-term program improved participants' attitudes toward wilderness, while the long-term program did not. Yoshino stated that the relationship between undergoing a wilderness experience and having a pro-environmental attitude was not always the same, and suggested that further investigation was needed. Lindley (2005) examined the wilderness attitudes of 87 participants who partook in an extended wilderness-based program by applying the Q Methodology to a pre-post design. There were some changes from the pre- to post-program to four-month follow-up, but they were not significant.

The studies noted above show that research concerning the effect of outdoor wilderness programs on attitudes toward nature/wilderness produced a variety of results. Many researchers hypothesized that attitudes would improve as a result of outdoor/wilderness experience. Although for some this proved to be true, surprisingly, some attitudes were not enhanced. Consequently, the causal relationship between outdoor/wilderness experience and attitudes toward nature/wilderness was left unexplained. Kellert and Derr (1998) noted the need for in-depth and focused studies to fully understand the impacts of outdoor experience. Some questions may include "Why are attitudes toward nature improved by outdoor experience?", "How deeply does a person need to perceive nature for their attitudes toward nature to be improved?", "What are the most significant factors in outdoor experience for improving attitudes toward nature?", and "In what case do attitudes toward nature not improve in spite of outdoor experiences?". Further investigation is needed to explore the relationship between outdoor experience and attitudes toward nature. In addition, no study to date has quantitatively evaluated the depth of outdoor experience and examined how it impacts attitudes toward nature. This study investigated the causal relationship between the depth of outdoor experience and attitudes toward nature by focusing on and quantitatively measuring the degree to which participants perceive nature.

Theoretical Framework

Determining the differences of quality between *outdoor experience* and *wilderness experience* is difficult. Few studies have detailed the differences between the two terms. The researchers in this study considered in-depth outdoor experience and wilderness experience to be similar concepts and thus adopted the WES (Borrie, 1995) to measure the depth of outdoor experience.

Some researchers have considered the theory that outdoor/wilderness experience affects attitudes toward nature. Borrie and Roggenbuck (2001) categorized the received wilderness experience benefits into three phases. The first, which occurs a few days into the wilderness experience, include a greater awareness of the human-environment relationship and a fascination with observations in nature. The second phase builds on the first and occurs about one-third of the way through the experience. This phase focuses on increased self-confidence, fewer distractions, and a greater sense of coherence. The third phase occurs about halfway through the trip and adds feelings of compatibility, relatedness to the surrounding environment, and a greater sense of contemplation about the benefits of the first and second phases. Attitude transformation toward nature conferred by an in-depth outdoor experience is hypothesized to follow a similar pattern.

Kellert and Derr (1998) conducted research to understand the effects of outdoor wilderness experience. They stated that changing attitudes toward nature is one of the major impacts of outdoor experiences. They found that participants' outdoor experience had a great impact on their respect for, affinity with, awe and appreciation of, and spiritual connection with the natural environment. They also noted the necessity of immersion in pristine natural settings.

Integrating these earlier studies, the researchers in this study explored how in-depth outdoor experience affects attitude toward nature using the following hypothesis as the research framework basis: Staying outdoors and facing the natural environment enhances awareness and sensitivity toward nature. A person's consciousness becomes immersed in the natural environment. Then, after developing a sense of oneness and connection with nature, a feeling of awe, respect, and appreciation that comes from direct experience with nature will influence a person's affective attitudes toward it.

Based on this hypothesis, the researchers attempted to verify that participants who undergo an in-depth outdoor experience during a backcountry hiking trip in a wilderness area would improve their attitudes toward nature. The hypothesis was tested using following three research questions.

- RQ1: Does an outdoor experience improve attitudes toward nature?
- RQ2: Does an in-depth outdoor experience improve a person's attitude toward nature more than a person who undergoes a less deep experience?
- RQ3: What elements of outdoor experiences are important contributors to the improvement of attitudes toward nature?

Method

Participants and Camp Program

The participants in this study were 44 students from grades 4-11 who attended the Camp Hanayama adventure course in 2010. The students in the adventure program participated in a backcountry hiking trip to the mountains, and an environmental program which utilized the surrounding natural environment. Participants experienced primitive living conditions at the Hanayama Campground (Miyagi, Japan), such as sleeping in tents and cooking outdoors. The early stages of the camp (Days 1-3) included setting up the group campsite, playing in the stream, and an environmental program. The environmental program was intended to foster participant engagement and fascination with streams running alongside the campground. Campers moved upstream, cleared away fallen trees and landslide debris, and then drew water. During the middle stage (Days 4-5), participants went on a one-night backcountry hiking trip to Mt. Kurikoma in the Kurikoma Quasi-National Park. They carried their own equipment, which included tents, sleeping bags, cooking gear and food. The first day, they walked on mountain tracks and in mountain streams for 6.5-8.5 hours. One group lost their way and reached the overnight camping spot in the dark. The second day, they walked on mountain tracks for 3-4 hours. After reaching their goal, they rested in a hot spring and returned to the campground by bus. Over the two days, participants hiked approximately 18 km and climbed about 997 m in altitude. The final stage of the camp (Days 6-8) included individual elective activities (canoe touring, playing & sleeping outdoors, work programs, and cooking & crafts), campfires, and clearing the tent site.

Participants were divided into living groups composed of six to seven members. There were three groups of elementary school students, two groups of junior high school students, and one group of high school students. Each group had a counselor who majored in outdoor education as an undergraduate or graduate student at an accredited university. For the backcountry hiking trip, participants were divided again into hiking groups to meet their requirements of the hiking course, in much the same way as the members of the living groups.

Instruments

Depth of outdoor experience. In order to measure the depth of outdoor experience, Borrie's (1995) WES was translated and administered. The original scale covered six aspects and included 23 items. Because participants were asked to complete the questionnaire every day of the camp, only two items were selected from each aspect to reduce the burden. Items with sufficiently high factor loadings and Cronbach's alphas were selected, and a questionnaire covering six aspects over 12 items was administered daily. Agreement with statements about the wilderness experience was evaluated for each item using a ten-point scale from "not at all" to "very much," similar to Borrie's original questionnaire.

Attitudes toward nature. Many attitudes scales toward the environment / nature / wilderness have been developed (Dunlap & Van Liere, 1978; Dunlap, Van Liere, Mertig, & Jones, 2000; Horvat & Voelker, 1976; Leeming, Dwyer, & Bracken, 1995; Millward, 1973; Musser & Mulkus, 1994). The learning content of a camp should correlate with the types of attitudes that are expected to change through camp participation. However, the scales above included various concepts concerning attitudes toward nature/wilderness, but also attitudes toward environmental issues and environmental ethics. To evaluate attitudes toward environment/nature/wilderness in outdoor programs, it is necessary to use a questionnaire that reflects the aim and learning content presented in camp. The researcher must either design a camp program that covers the content of the questionnaire, or develop a questionnaire that references the camp program. The latter approach was adopted in this study: the questionnaire of attitudes toward nature was developed to correlate with the aims and content presented in the camp.

First, items that related to attitudes toward nature were gathered from 86 participants (grades 4-12) using an open-ended questionnaire during Camp Hanayama in 2008 and 2009. From the responses, 155 items such as "I like the mountains" and "I want to take care of the natural environment" were arranged into a pilot questionnaire. A pilot test was then conducted on 342 subjects (100 elementary, 138 junior high, and 104 high school students). After removing items that were judged unsuitable or showed ceiling effects, factor analysis was used to finalize the scale of attitudes toward nature.

Data collection. Camp Hanayama's operation style made conducting the camp program twice and setting up a comparable control group impossible. Therefore, the researchers focused on the degree to which each participant perceives nature instead of whether or not participants took part in an outdoor wilderness program. In brief, we did not compare the attitudes of those who had an outdoor experience and those who did not, but rather compared the attitudes of those who underwent an in-depth outdoor experience with those who perceived the experience less deeply within the same program.

The depth of outdoor experience was measured every day during the camp. Participants answered the questionnaire in nightly group meetings. They described a notable experience from the day that was used for the outdoor experience qualitative data. The experience was also rated by selecting "good experience," "bad experience," or "neither good nor bad". Attitudes toward nature were measured at the beginning of camp on the first day, before the backcountry hiking trip at the end of the third day, after the trip in the evening of the fifth day, and immediately after camp on the eighth day (Table 1).

Table 1

Camp Program and Data Collection Procedure

Early stage of camp			Middle stage of camp		Final stage of camp		
1st day	2nd day	3rd day	4th day	5th day	6th day	7th day	8th day
	<u>Environment al program</u>	<u>Group free time</u> (Playing in the stream)	<u>Backcountry trip START</u>	<u>Backcountry trip FINISH</u> Rest (Hot spring)	<u>Elective activities</u> START	<u>Elective activities</u> FINISH	<u>Cleaning up</u>
● Attitudes				● Attitudes			◎ Depth
<u>Setting up</u>		● Attitudes					● Attitudes
Night hiking						Camp fire	
◎ Depth	◎ Depth	◎ Depth	◎ Depth	◎ Depth	◎ Depth	◎ Depth	◎ Depth

● Attitudes: Attitudes toward Nature ◎Depth: Depth of Outdoor Experience underline: Main program of the day

Data analysis. Participants were divided into two groups for data analysis: those who had in-depth outdoor experiences (high-experience group), and those who did not (low-experience group). The attitudes of the two groups toward nature were compared in a pre-post design. Because some of the scores already showed significant differences between groups in the pre-test, covariance analysis was employed. The post-test scores were compared to see whether there were any significant differences after adjustments were made to cancel out the observed pre-test significant differences. The scores at the beginning of camp were regarded as the covariate in the early stage, the scores before the backcountry hiking trip as the covariate in the middle stage, and the scores after the backcountry hiking trip as the covariate in the final stage. Then, each post-test score was analyzed to see whether there were significant inter-group differences. Covariance analysis was also used after dividing the participants into high- and low-experience groups based on their scores on the six aspects of the modified WES at each stage. The software used for analysis was SPSS Advanced Models 11.0J for Windows. Participants whose data had missing values or outliers were all excluded from analysis. Significance was set at $p < 0.05$ for all statistical tests. The qualitative data about the outdoor experience were categorized and counted in cross tabulations.

Results

Scale of Attitudes toward Nature

As a result of the exploratory factor analysis, the researchers devised a five-factor structure because those factors had eigenvalues over 1.0 and good explanatory potential (Table 2). The first factor was named *Pro-environment*, because it included items like taking care of nature and concern for the environment. The second factor was named *Positive affect*, because it consisted of feelings like preference for natural objects and activities in nature. The third was named *Camp*, because it contained items describing affective, cognitive, and behavioral attitudes toward the camp. The fourth factor was named *Environmental ethic*, because items presented participants' views of the relationship between humans and nature, such as "Humans should not use nature more than necessary" and "Humans pollute nature." Although there was a fifth factor

which included two items, "I like bugs" and "I hate bugs," it was excluded because it did not fit the scale used in this study. Thus, the four factors Pro-environment, Positive affect, Camp, and Environmental ethic were adopted for the attitudes toward nature scale. Three representative items were selected for each factor based on the following criteria: their factor loading was sufficiently high, the items did not resemble each other, and they reflected the concepts of the factor. A scale of four factors with 12 items was thus constructed.

Table 2

Results of Factor Analysis of Scale of Attitudes toward Nature (n=342)

Items	I	II	III	IV	V
I want to make the environment better	.84	-.18	.04	.06	-.04
It is good to take care of nature ❁	.81	-.08	-.03	.01	-.10
I want to avoid harming nature as much as possible ❁	.77	-.07	-.06	.08	.05
I want to take care of nature ❁	.70	.02	.02	.12	.09
I prefer to show concern for nature	.56	.17	.03	.01	.06
I like being alone in nature	-.26	.85	-.14	.14	-.11
I like mountains ❁	-.12	.77	.19	.00	.04
I like forests ❁	.04	.63	-.07	.13	.06
I like streams ❁	.30	.55	-.02	-.14	-.06
I like nature	.30	.50	-.02	.09	.05
It is good to be in contact with nature	.42	.44	.00	-.08	-.17
I like hiking	.13	.42	.16	-.28	.13
I like camping ❁	.00	-.08	.96	.00	.05
I want to go camping ❁	-.11	.00	.91	.02	.05
Camping is good ❁	.10	-.02	.78	.04	-.13
Humans pollute nature ❁	.14	-.04	-.09	.52	.05
Humans are kept alive from nature ❁	.07	.19	.03	.49	.03
Human should not use nature more than necessary ❁	.19	-.06	.06	.44	-.20
It is hard to live in nature	.01	.14	.20	.39	-.07
I like bugs	-.04	-.09	.02	.09	.93
I hate bugs	.04	.01	.03	.16	-.70
I want to know more about animals	.21	.20	-.02	.16	.32
It is good to take care of places where wildlife lives	.32	.08	.00	.29	.01
Factor correlation	I	II	III	IV	
	II	.70			
	III	.50	.54		
	IV	.65	.51	.34	
	V	.24	.50	.32	.19

Cronbach's alpha was calculated to check the internal consistency of the scale. The first factor was determined to be 0.81; the second, 0.75; the third, 0.90; and the fourth, 0.62. Although

the fourth factor was relatively low, all other factors were high enough to conclude that the scale is internally consistent.

Effects of in-depth outdoor experiences on attitudes toward nature. The covariance analysis results for the early, middle, and final stages of the camp are shown in Table 3. There was a significant difference between the post-test scores of the two groups only for the analysis of the middle stage (Total: $F = (1, 30) = 9.82, p < .01$; Pro-environment: $F = (1, 30) = 4.30, p < .05$; Positive affect: $F = (1, 30) = 10.95, p < .01$; Camp: $F = (1, 30) = 5.37, p < .05$). These results verified that the attitudes toward nature of participants who had an in-depth outdoor experience in the middle stage improved more than the attitudes of those who did not. No difference was found between the groups in the early and final stages of the camp. This shows that the in-depth outdoor experience of the backcountry hiking trip undertaken during the middle stage of the camp influenced the participants' attitudes toward nature.

The covariance analysis results for the high- and low-experience groups by scores for the six WES aspects are shown in Table 4. In the middle stage, solitude was the only aspect where the high-experience group exhibited greater improvement in their attitudes toward nature than the low-experience group ($F = (1, 30) = 7.49, p < .05$). No significant differences were found in the analysis of the early and final stages. This suggests that solitude, among other factors, influences attitudes toward nature.

Qualitative data of outdoor experience. The qualitative data from the middle stage was categorized and counted into cross tabulations by group (Table 5). The high-experience group rated experiences as 81% "good", while the low-experience group did for only 64% of experiences. On the other hand, there were only two "bad" ratings (6%) from the high-experience group, while the low-experience group had six (18%). Irrespective of rating, the high-experience group most often endorsed *nature* (22%) and *sleeping outside* (19%) items, while the low-experience group did for *trouble* (28%) and *hiking* (21%) items.

Table 3

Results of Covariance Analysis of Attitudes toward Nature between High- and Low-Experience Groups

Group	PRE		POST		Covariance	
	Mean	SD	Mean	SD	F	p
Early stage						
Attitudes toward Nature						
High (17)	89.53	5.14	88.12	5.77	0.07	
Low (16)	79.70	10.33	83.95	7.43		
Pro-environment						
High (17)	22.88	1.17	22.88	1.93	1.64	
Low (16)	18.69	4.45	20.95	2.89		
Positive affect						
High (17)	22.35	2.57	22.47	1.91	0.72	
Low (16)	20.88	2.77	21.06	2.67		
Camp						
High (17)	22.00	1.70	21.53	2.00	0.42	
Low (16)	19.38	2.92	20.63	2.22		
Environmental ethic						
High (17)	22.29	2.28	21.24	2.68	3.94	†
Low (16)	20.75	3.53	21.31	3.42		

Table continues.

Table continued.

Middle stage						
Attitudes toward Nature						
High (17)	87.75	6.16	90.70	4.73	9.82	**
Low (16)	84.54	7.29	83.50	7.24		
Pro-environment						
High (17)	22.81	2.04	23.25	1.44	4.30	*
Low (16)	21.13	2.85	21.18	2.58		
Positive affect						
High (17)	22.25	2.11	23.00	1.46	10.95	**
Low (16)	21.35	2.60	20.42	3.33		
Camp						
High (17)	20.88	2.42	22.14	2.56	5.37	*
Low (16)	21.29	1.86	20.78	1.45		
Environmental ethic						
High (17)	21.81	2.46	22.31	2.21	0.60	
Low (16)	20.76	3.46	21.12	3.10		
Final stage						
Attitudes toward Nature						
High (17)	88.61	6.07	89.06	6.36	0.20	
Low (16)	85.26	7.84	85.78	7.97		
Pro-environment						
High (17)	22.53	2.37	22.24	2.44	0.68	
Low (16)	21.81	2.29	22.21	1.83		
Positive affect						
High (17)	22.42	2.19	22.53	2.58	0.01	
Low (16)	20.88	3.34	21.39	2.93		
Camp						
High (17)	21.84	2.51	22.00	2.26	0.09	
Low (16)	21.01	1.64	21.37	2.18		
Environmental ethic						
High (17)	21.82	2.16	22.29	2.11	4.09	†
Low (16)	21.56	3.31	20.81	3.17		

† p<0.10 * p<0.05 ** p<0.01

Table 4

Covariance of Attitudes toward Nature during the Middle Stage

Group	PRE		POST		Covariance	
	Mean	SD	Mean	SD	F	p
Oneness						
High (16)	87.81	5.48	89.15	5.80	1.11	
Low (17)	84.48	7.75	84.95	7.72		
Timelessness						
High (17)	84.76	7.51	86.67	8.31	0.47	
Low (16)	87.51	5.99	87.33	5.74		
Primitiveness						
High (17)	88.00	6.63	89.90	5.10	3.69	†
Low (16)	84.08	6.69	83.90	7.71		
Humility						
High (16)	88.56	6.46	90.20	5.10	3.00	†
Low (17)	83.78	6.56	83.97	7.47		
Solitude						
High (16)	88.50	5.88	90.89	3.68	7.49	*
Low (17)	83.84	7.10	83.32	7.61		
Care						
High (18)	87.17	7.26	88.14	7.98	0.23	
Low (15)	84.81	6.33	85.62	5.78		

† p<0.10 * p<0.05

Table 5

Cross Tabulation of Qualitative Data on Outdoor Experience

	High experience group				Low experience group			
	Good	Neither	Bad	Total	Good	Neither	Bad	Total
Trouble	2	1	1	4 (12%)	4	2	3	9 (28%)
Bugs	1	2	1	4 (12%)	1	1	2	4 (12%)
Hiking	2			2 (7%)	4	2	1	7 (21%)
Nature	7			7 (22%)	5	1		6 (18%)
Achievement	4			4 (12%)	4			4 (12%)
Sleeping outside	6			6 (19%)	1			1 (3%)
Etc	4	1		5 (16%)	2			2 (6%)
Total	26 (81%)	4 (13%)	2 (6%)	32	21 (64%)	6 (18%)	6 (18%)	33

Discussion

Scale of Attitudes toward Nature

Factor names. The first factor was named Pro-environment. Camp participants began to take care of nature and concern themselves with the environment after camp (Hanna, 1995; Jordan, Hungerford, & Tomera, 1986; Stern et al., 2008). This factor is an appropriate one to include in our scale, because the attitudes covered by this factor are expected to improve owing to camp participation. The second factor, Positive affect, has been clearly identified as necessary for improving a person's environmental attitudes (Christy, 1982; Orren & Werner, 2007). The third factor was named Camp. Millward (1973) developed the Millward-Ginter Outdoor Attitudes Inventory (MGOAI) as a scale for assessing environmental attitudes. The MGOAI appears to be generalizable since many researchers have administered it. The MGOAI includes a factor named *Education*, which is composed of attitudes toward outdoor activities. Items in Millward's Education category are similar to the items included in this study's Camp factor. Thus, the researchers considered the inclusion of Camp in the scale for this study was appropriate. The items that make up the fourth factor, Environmental ethic, are similar to the concepts of the New Environmental Paradigm (Dunlap & Van Liere, 1978), which represented topics in environmental ethics such as human administration of the natural environment, and of the New Ecological Paradigm (Dunlap et al., 2000). Camp participation would appear to improve a participant's environmental ethic, because the camp increased the participant's proximity to nature and included elements of environmental education. Therefore, this factor is an appropriate part of the scale modified for this study. On the other hand, contents of the fifth factor were about bugs, and there were only two items that captured feelings about bugs: "I like bugs" and "I hate bugs." These two items measured the exact same attitudes about bugs and were very restrictive compared with the items that made up the other factors. Therefore, the fifth factor was not adopted.

Validity. The scale of this study was developed to investigate and assess Camp Hanayama participants' attitudes toward nature. To gather the items for the scale, open-ended questionnaires were administered to participants at Camp Hanayama for two years, prior to the group examined in the present study. The taken items were suited to explore the attitudes of subjects who participated in Camp Hanayama because their attitudes were expected to improve as a result of camp participation. Therefore, it can be assumed that the content of the scale was valid and included appropriate items to measure attitudes toward nature that are improved by the camp experience.

In addition, the factors of this scale were developed using exploratory factor analysis and by comparing each factor with previous research. Although the fifth factor, which concerned bugs, was excluded after factor analysis, the scale had at least somewhat good construct validity. Therefore, the scale of attitudes toward nature developed in this study had sufficient validity and was appropriate for the purposes of this research.

Effects of in-depth outdoor experience on attitudes toward nature. The analysis compared attitudes toward nature between high- and low-experience groups in terms of scores measuring their depth of outdoor experience. The findings revealed that participants who had deeper outdoor experiences during the backcountry hiking trip in the middle stage of the camp had more-improved attitudes toward nature after the trip. This suggests that the in-depth outdoor experience during the backcountry hiking trip in the middle of the camp had some particular quality that was different from the other experiences in the program. Using observation, interviews,

and journal analysis of participants in a wilderness experience program, Fredrickson and Anderson (1999) discovered that being in a pristine wilderness setting, away from the trappings of modern civilization, is a specific condition of wilderness experiences that may contribute to spiritual connection. Stringer and McAvoy (1992) discovered contributing factors to spirituality by analyses of participant questionnaires, observations, interviews, and journals. They elucidated factors of being in a wilderness environment that contributed to the positive experience, and also suggested that the wilderness provides a place in which one can learn and grow. Certainly the participants in the present study lived primitively, sleeping in tents and cooking outdoors, but the base camp in this study (Hanayama campground) had some buildings which included a central cabin, food storage cabin, main hall, sheds, bathrooms, and resources like plumbing and electricity. On the other hand, participants on the Mt. Kurikoma backcountry hiking trip had fewer buildings and facilities, and they walked mainly in mountain streams and on mountain trails. Participants collected drinking water from a spring, slept in the forest as a group, and appeared separated from the existence of other people and man-made items like they did in the campground. An environment where people do not feel other human presence may be one element that leads to improved attitudes toward nature.

Through analysis of the six different WES aspects (Table 4), the researchers found that solitude influenced attitudes toward nature in the high-experience group. Nicholls and Gray (2007) conducted a qualitative investigation to understand the effects of a four-day challenge-based adventure therapy program on 15 residents of a drug and alcohol rehabilitation center who had destructive attitudes toward the natural environment. They found that the participants improved these destructive attitudes, and that the stillness and quiet time contributed to the development of human-nature relationships. During the backcountry hiking trip in this study, participants encountered pristine wilderness because they rarely met any other visitors, and lived without man-made devices. They also spent a night in the wilderness and could appreciate its stillness and profundity. It appeared that an in-depth outdoor experience such as facing the wilderness with calm and peaceful minds improved their attitudes toward nature. Early studies indicated that solitude is an important factor for a positive wilderness experience (Borrie, 1995; Cole & Hall, 2009; Heintzman, 2003). As with early studies, this study found that solitude is the most important and effective factor for changing attitudes.

Although only solitude showed a significant difference at $p < .05$, some WES aspects were marginally significant at ($p < 0.10$). The high- and low-experience groups showed marginally significant differences in terms of primitiveness ($F = (1, 30) = 3.69, p < .10$) and humility ($F = (1, 30) = 3.00, p < .10$) in the middle stage of camp, and oneness ($F = (1, 30) = 3.93, p < .10$) in the early stage.

Christy (1982) examined the effects of a primitive camp setting and a central camp setting on environmental attitudes. Compared with the central camp participants – who lived in cabins, ate prepared food in a dining room, and used bathrooms and showers – the primitive camp participants – who slept in tents, cooked outdoors, and used latrines – had more-improved environmental attitudes. The study suggests that the primitiveness of the camp had an effect on environmental attitudes. Christy also indicated that the primitive camp participants gained positive affect, which included elements of confidence and a sense of achievement gained through experiences that demanded responding to an extraordinary natural environment. Staff members treated them as adults, and they gained a sense of fulfillment by achieving unfamiliar tasks. The participants on the backcountry hiking trip experienced a simple lifestyle as they walked, rested, ate, and slept in the wilderness far away from the campground, and responded to varying natural environments on their own. The counselors facilitated self-sufficiency and the participants prepared and packed their own equipment, set up their own tents, and cooked their own meals. Thus they obtained a sense of achievement by the end of the backcountry hiking trip. Undergoing such an

experience gave participants a sense of fulfillment and positive feelings, and improved their attitudes toward nature. Moreover, Patterson, Watson, Williams, and Roggenbuck (1998) noted that wilderness experience has two dimensions they termed *challenge* and *decisions not faced in the everyday environment*. The backcountry hiking trip was adventurous and challenging. Participants needed to make decisions that were not typical in everyday situations, such as how to divide equipment among backpacks, where to set up tents, and who would cook which meals. With a counselor's help, participants successfully completed their adventure challenge in the wilderness by themselves. These elements might have conferred the major depth of the outdoor experience to the participants. The results of previous studies in conjunction with this study showed that undergoing such an experience gave them a sense of accomplishment and positive feelings, which appears to have played an important role in improving their attitudes toward nature.

Loeffler (2004) investigated the meaning of outdoor experience by using a qualitative, photo elicitation method during an outdoor program. As a result of being on outdoor trips, the study subjects mentioned, "awe" as an element they associated with the natural world. Kellert and Derr's (1998) subjects reported a sense of humility and spiritual connection with the natural world as a consequence of outdoor experience. They further discussed the fact that outdoor challenges, which have elements of risk, danger, and uncertainties, provoke fears and anxieties toward nature, but can nonetheless foster positive sentiments of awe, humility, and respect for nature. They also stated that the notion of awe encompasses elements of reverence and power, as well as of fear. In the present study, the first day of the backcountry hiking trip was foggy and some of the participants could see a sea of clouds the next morning. Situations like this enhanced the mystical atmosphere of the mountain and humbled them before the grandeur of nature. Further, two groups lost their way during the trip and consequently felt much fear and anxiety. This may have provoked a sense of awe and humility in those groups. Although these conditions were unexpected, the sense of awe and humility regarding nature provoked by such conditions might have caused changes in participants' attitudes toward nature.

Oneness impacted attitudes toward nature in the early stage, but not in the middle stage. This result was unexpected because some earlier studies indicated that oneness and closeness are important components of the wilderness experience (Borrie & Roggenbuck, 2001; Talbot & Kaplan, 1986). Although it is difficult to explain, perhaps the meaning of oneness depends on the environmental setting. The impact of oneness is not likely displayed in a wilderness setting, but in a relatively rich natural environment such as a campground. During the early stage, only the high-experience group, who were capable of feeling oneness even around the campground, displayed improvements in their attitudes. During the middle stage however, impacts for oneness could be observed for both groups, and thus there was no significant difference between them. This corroborates that, as shown by Yoshino (2005) and Lindley (2005), the study of the relationship between experience and attitudes can provide unexpected results. Although there was no doubt that solitude was a significant factor affecting attitudes toward nature, there is still room for further research concerning the mechanisms by which outdoor experience affects attitudes toward nature.

Many of the high-experience groups mentioned sleeping outside as the most notable experience of the day and all evaluated the experience as "good" (Table 5). Participants could physically and mentally relax because they set up their own tents, cooked their own meals, and properly shared these roles with each other in their wilderness campsite. Appreciating the wilderness during midnight and early in the morning in a quiet mood appeared to encourage a sense of solitude and humility. Further, the simple lifestyle of only eating and resting encouraged a sense of primitiveness. On the other hand, more participants in the low-experience group evaluated the experience as "bad" than the high-experience group. In particular, they evaluated trouble

(e.g. getting lost or injured) and bugs as “bad”. Orren and Werner (2007) concluded that environmental attitudes of brief wilderness program participants did not change because considerations of a person’s feelings toward the environment were not included. Orren and Werner emphasized that brief programs hoping to improve environmental attitudes need activities that boost positive feelings about the environment. Christy (1982) also stated the necessity of positive feelings. The low-experience group mentioned trouble and bugs as the most notable experiences of the day, and tended to give “bad” evaluations. This may account for spoiled positive feelings toward and connections with the natural environment, and may interfere with improving their attitudes toward nature.

Conclusion and Recommendations

The results of this study revealed that an in-depth outdoor experience during a backcountry hiking trip differs from other programs experiences and influences the improvement of attitudes toward nature. The results also identify the importance of solitude, primitiveness, and humility.

Recommendations for Future Research

Some outstanding issues remain. First, this study lacked a control group. The results suggested that conducting only a backcountry hiking trip, not during a camp, would improve attitudes toward nature. However, it might be important that such a program include not only the backcountry hiking trip itself, but also a period in which to prepare for the trip, and sufficient time to reflect and interpret the meaning of the experience as well. Hendee and Brown (1987) discussed a conceptual model and theory of wilderness experience programs, and indicated the necessity of preparation and reflection in outdoor experiences. Thus, integrating a backcountry hiking trip into an organized camp would be expected to yield good results. To prove this, it is necessary to compare a backcountry hiking trip integrated into an organized camp with a trip conducted separately. Also, in order to establish the benefits of a camp integrated backcountry hiking trip, it would have to be compared with control group participants from an organized camp with similar program contents, natural environment, instructors, and participant groups as Camp Hanayama, but did not include a backcountry hiking trip. It was not possible to set up such a control group for this study. Further research is needed to compare camps between which various conditions are controlled.

Participant shortage was the second issue. Because it was impossible to set up a control group in this study, participants were divided into high- and low-experience groups according to their depth of outdoor experience, and then compared. Excluding missing values and outliers in participant data further decreased the number in each group. In order to increase the reliability of the analysis, more investigation with additional participants is needed.

Recommendations for Practice

It is currently generally agreed that the elements of environmental education programs are important in improving attitudes toward nature. In conducting an adventure education program such as a backcountry trip however, undergoing an in-depth outdoor experience and welcoming its aspects of solitude, primitiveness, and humility improved attitudes toward nature. Program directors should choose wilderness environments with no traces of human activity. Recesses of mountains/forests or uninhabited islands provide an appropriate environment for such an in-depth outdoor experience, but famous sightseeing areas where many visitors gather may

not. Before a backcountry trip to the appropriate environments participants need preparation. Simple and primitive lifestyles should be implemented during daily campground routines to teach participants how to behave in a natural environment. Program directors should plan programs for participants to gain knowledge, skills, and independence. If the participants become independent enough, the director and counselor can trust the participants to make their own decisions regarding various situations such as where to set up a tent, how to cook, and how to travel. The participants will have to observe the natural environment more carefully, and gather information around them to make decisions for their backcountry trip. In doing so, their consciousness will become immersed in the natural environment, and convey senses of connection, awe, and appreciation toward nature. This would not happen if the participants had passive attitudes and were totally dependent on the counselor during the backcountry trip. It is important for participants to work on challenges independently. In addition, program directors should provide opportunities that foster deep feelings toward nature. A long expedition will encourage solitude, primitiveness, and humility, which all provide an in-depth outdoor experience. After spending long periods of time in the wilderness, participants' consciousness will be very sensitive to in-depth outdoor experience. Finally, the importance of positive feelings and notable experiences towards nature must not be forgotten in improving attitudes toward nature. If participants are not ready for tough challenges, or not willing to go on a backcountry trip, the experiences will cause negative feelings toward nature. Program directors need to properly consider and control an entire program to achieve the greatest possible success in a backcountry trip.

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