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## ENVIRONMENTAL SENSITIVITY AND OUTDOOR RECREATION SETTING PREFERENCES

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### Introduction

Environmental sensitivity is “a set of affective attributes that result in an individual viewing the environment from an empathetic perspective” (Peterson, 1982, p. 6). Individuals possessing sensitivity toward the environment maintain a basic appreciation of and concern for the natural environment. Hence it is an attitudinal position one takes toward the environment, which separates environmental sensitivity from environmental awareness. Environmental awareness is simply the maintenance of a consciousness of the environment. Environmental sensitivity involves caring about the environment.

Over the last 30 years, researchers have considered the complexities of “environmental sensitivity,” specifically, the factors that cause people to care or be concerned about the environment. Such research emerges from the notion that environmental sensitivity is the first step in a developmental process that leads persons toward environmental literacy or what Chawla (1998) calls a sense of “ownership” and “empowerment” (p. 11) regarding protection of the environment. In this sense, environmental sensitivity becomes the foundation on which environmental educators can build. By exploring the relationship between environmental sensitivity and other variables, environmental educators may be provided with means of fostering pro-environmental attitudes and behavior.

Research in this area has usually followed one of two approaches. One group of researchers focused on the “significant life experiences” individuals, usually environmental leaders, reported as formative influences on their environmental sensitivity (e.g., Corcoran, 1999; Place & Ewert, 2004; Sward, 1999; Peterson, 1982; Tanner, 1980). The second approach attempted to find correlates of environmental concern, usually focusing on outdoor recreation, among more varied samples of general populations (Dunlap & Heffernan, 1975; Geisler, Martinson, & Wilkening, 1977; Theodori, Luloff, & Willits, 1998; Van Liere & Noe, 1981). Results from both approaches have often suggested a relationship between outdoor experiences and environmental sensitivity, but not consistently or strongly. Recognizing that “outdoor recreation” can be or mean many things, researchers recently have attempted to discern the character of the outdoor experiences that form the frame of reference. Bright and Porter (2001) found type of wildlife recreation (hunting or fishing methods, nature viewing) to explain elements of environmental concern or participation. Comparing groups with different levels of environmental sensitivity (ES), Bustam, Young, & Todd (2005) found higher ES groups favored outdoor recreation experiences that feature “environmental connection” and “challenge and learning.” Continuing this research on the characteristics of outdoor recreation that are the differential of higher and lower ES levels, the present study sought to determine if people with different levels of environmental sensitivity prefer different kinds of outdoor recreation settings.

## Related Research

### *Significant Life Experiences*

Early research on significant life experiences, conducted by Peterson (1982) and Tanner (1980), suggested that environmental appreciation began at a young age and in outdoor settings. Specifically, Tanner's research on "Significant Life Experiences" led the way for subsequent research on influential factors on the development of environmental sensitivity. He focused his efforts on understanding the different types of experiences that produce an environmentally active and informed citizenry that works to fulfill the aim of environmental education: to maintain a resource-rich planet for future generations. Tanner selected participants from multiple citizen groups for his sample, as he thought these individuals were representative of active and informed citizen conservationists. His participants were asked to report on perceived influences on their environmental sensitivity (ES). Respondents most frequently claimed the "outdoors" as an influential life experience on environmental sensitivity, followed by "habitat" and "parental" influence. Many respondents expressed a continuous growth in their ES from childhood through adult life.

In continuing Tanner's line of inquiry, Peterson (1982) attempted to isolate influential factors on environmental sensitivity, as perceived by professional environmental educators, by conducting interviews of 22 environmental educators. With similar findings to Tanner (1980), Peterson's study revealed "interaction with the outdoors" as well as "parental influence and other role models" to be important influences in the development of environmental sensitivity. In addition, Peterson found the influences in the development of environmental sensitivity were on-going, long-term, and began at an early age (on average, 12 years old).

Recent studies on this topic have also selected participants based on their perceived pro-environmental ways and environmental sensitivity. These studies further support outdoor recreation as one of several influences on participants' environmental concern. In a 1999 study by Corcoran (1999), outdoor experiences, family, and media were claimed most influential on ES by environmental educators. Sward's (1999) study of professional environmentalists from El Salvador revealed youthful outdoor experiences and witnessing environmental destruction to be the most formative experiences.

All of these studies of "significant life experiences" focused on persons in environmental vocations or avocations. They do not show how or if these influences were present or absent in the lives of persons less involved with the environment. This shortcoming led Chawla (1999) to call for comparative studies between groups with differing levels of environmental regard. Place and Ewert (2004) took on this challenge in their study of over 500 university students who were classified as either ecocentric or anthropocentric using the modified New Environmental Paradigm. Once classified, discriminant analysis considered 15 early life experiences, taken from the earlier studies, as predictors of environmental attitude. Ultimately five variables were found to be significant: outdoor activities with family, media, consumptive experiences, and appreciative outdoor experiences (alone or with friends). Place and Ewert also noted that only 27 of 537 (5%) respondents were measured as anthropocentric. This unexpected finding questions the value of the NEP for differentiating environmental attitudes. Place and Ewert speculated that respondents may have tried to give socially acceptable answers.

*Outdoor Recreation and Environmental Concern*

Another group of researchers have taken various approaches to studying what some have called the Dunlap and Heffernan (1975) hypothesis that outdoor recreation participation is positively related to environmental concern. As will be illustrated, these studies have had found weak support for the hypothesis, but most are noteworthy for their larger samples and their sampling of more diverse populations than those involved in the studies of significant life experiences (Bustam, Young, & Todd, 2003; Dunlap & Heffernan, 1975; Geisler, Martinson, & Wilkening, 1977; Theodori, Luloff, & Willits, 1998; Van Liere & Noe, 1981).

In a Washington State survey conducted by Dunlap and Heffernan (1975), outdoor involvement was hypothesized to be associated with environmental concern. Respondents were asked to assign priorities to a list of governmental expenditures that focused on protecting natural resources and controlling pollution. This measurement was intended to be a good indicator of environmental sensitivity as respondents were forced to decide how much value should be placed on environmental quality versus other societal goals. Dunlap and Heffernan measured participation in outdoor recreation activities by asking respondents to rate their participation in a list of recreation activities. The results indicated weak support for their hypothesis, and Dunlap and Heffernan suggested the need for more extensive exploration of this relationship.

Geisler et al. (1977) further investigated Dunlap and Heffernan's (1975) hypothesis. Their sample population, all Wisconsin residents, was asked to classify the level of seriousness of environmental problems such as pollution and wildlife reduction, to measure environmental concern. Similar to Dunlap and Heffernan's approach, respondents were asked to prioritize public expenditures for water pollution control, public forestlands, public parks, and areas for wildlife protection. Respondents were also presented with a list of outdoor activities and asked to indicate their rate of participation. Unlike Dunlap and Heffernan, Geisler et al. found considerable consistent support for their hypothesis. However, results from both studies yielded low associations.

To further examine the Dunlap and Heffernan hypothesis, Van Liere and Noe (1981) collected data from visitors to Cape Hattaras National Seashore. Van Liere and Noe measured environmental concern by using the 12-item "New Environmental Paradigm" (NEP) scale designed by Dunlap and Van Liere (1978). Their measure of outdoor recreation differed from earlier studies. Respondents were asked to indicate the number of hours per day spent in each of the activities presented on a list. In addition, respondents were asked to indicate the number of days in which they engaged in the activity during their visit. Van Liere and Noe expected the improvements on environmental concern and recreation participation measurements to produce stronger findings than previous studies. Their findings did not meet their expectations. Low association between outdoor recreation participation and environmental concern provided weak support for their hypothesis.

Theodori et al. (1998), measured the relationship between outdoor recreation participation and pro-environmental behavior. To measure pro-environmental behavior, the authors asked each person in their sample, all residents of Pennsylvania, to respond to a list of environmentally conscious behaviors (e.g., contributed money or time to an environmental or wildlife conservation group; stopped buying a product because it caused environmental problems).

Respondents were also asked to identify, from a list of outdoor recreation activities, those in which they participate, as a measure of outdoor recreation participation. Theodori et al. found considerable support for their hypothesis. Furthermore, Theodori et. al. suggest using pro-environmental behavior as a better measure of environmental concern than environmental attitudes.

Thus far, the studies mentioned have taken one of two approaches. One group, usually studying environmentalists and the formative influences on their ES, suggested a relationship between ES and outdoor experiences, specifically during youth. Other studies, usually sampling more varied populations, explored the relationship of ES and outdoor recreation participation. Most found a weak positive relationship. One recent study, limited by its small sample of college students, combined the approaches of these two bodies of research. Bustam, Young, and Todd (2003) compared groups of college-age students representing three different levels of environmental sensitivity. The groups did not differ in their claims that outdoor recreation experiences shaped their environmental sensitivity nor did they differ in their level of outdoor recreation participation as adults. However, they differed significantly in their preference for outdoor recreation activities while growing up. When asked to list their favored recreation activities while growing up, groups with higher levels of environmental sensitivity were more likely to list activities that would be classified as *outdoor recreation*, versus *sports and athletics* or *arts/crafts/hobbies*. Although limited by its sample, this study is suggestive in its measurement of involvement in outdoor recreation and its comparative design.

#### *Character of Outdoor Recreation*

Further investigation into the association between outdoor recreation experiences and environmental sensitivity is needed. Recognizing that most Americans have had outdoor recreation experiences, Bright and Porter (2001) and Bustam, Young, and Todd (2005) have suggested the need to look at the character of outdoor recreation participation, not simply the quantity, when studying the relationship of ES and outdoor recreation. Outdoor recreation is a broad category, sometimes simply defined as any recreation activity taking place outdoors, but often distinguished from consumptive, mechanized, and motorized activity (Jackson, 1986; Tarrant & Green, 1999), identified by the desired consequences or experience preferences (e.g., Driver & Knopf, 1977), or classified according to the settings in which the experiences takes place (e.g., Virden & Knopf, 1989). These and other aspects are prevalent in outdoor recreation research, but have not yet been explored in relationship to environmental sensitivity. Few exceptions include Bright and Porter (2001) who found type of wildlife recreation (hunting or fishing methods, nature viewing, etc.) to explain elements of environmental concern. Bustam, Young, and Todd (2005) compared the experience preferences of groups having three different levels of environmental sensitivity. On an instrument with 28 experience preferences statements that fit into five experience categories, groups differed in their preference for experiences in the categories of environmental connection and challenge and learning, but not social harmony or escape. In the experience category of self-efficacy, groups did not differ, but in two items, "feeling of self-confidence" and "feeling of independence," they did. Both studies confirm the suggestion that the character of outdoor recreation experiences may hold a key to better understanding the relationship between environmental sensitivity and outdoor recreation.

In considering what shapes the character of outdoor recreation experiences, certainly the recreation setting comes to mind. Recreation managers have generally accepted the value of distinguishing among different types of recreation settings. The Recreation Opportunity Spectrum (USDA Forest Service, 1983) is arguably the most widely used approach to characterizing outdoor recreation settings. Recreation Opportunity Spectrum (ROS) settings are a group of component ranges along a spectrum of areas suitable for high-density use to sparsely used primitive areas. Fundamental to the concept underlying the ROS is that people vary in their preferred settings for outdoor recreation and that recreation settings need to be managed to provide and maintain a full spectrum of recreation opportunity settings. Typically, the ROS is presented with six identified ranges or opportunity classes: urban, rural, roaded natural, semi-primitive motorized, semi-primitive non-motorized, and primitive. A multiplicity of factors of interest or relevance to managers, visitors, researchers, and others define these recreation opportunity classes. Examples include access, other non-recreational resource uses, environmental modification, on-site management, social interaction, acceptability of visitor impacts, and acceptable level of regimentation.

The Recreation Opportunity Spectrum (ROS) has informed research on the relationships among recreation activities, experiences, and settings. Virden and Knopf (1989) surveyed nearly 1600 summer visitors to the America Flats Management Area in Colorado. The first section of the questionnaire asked respondents to choose one activity, from a list of possible outdoor recreation activities, that would be most preferred. Second, respondents were asked to rate the importance of specific items as possible reasons for their participation in the activity. Third, respondents were asked to rate their preferred recreation settings, operationalized from the eight setting dimensions of the Recreational Opportunity Spectrum (ROS). For each of these setting dimensions, descriptors were provided for the six ROS land classes. The descriptors were paraphrased from the ROS User's Guide and pertained to "degree of naturalness," "evidence of other users," "amount of contact with other people," and "nearness to roads" (Virden & Knopf, 1989, p. 162). Their findings suggested the relevance of "setting preference" in understanding the nature of outdoor recreation preferences and experiences.

In sum, past investigations of environmental concern have taken two approaches. One group approached the relationship directly, by correlating measures of outdoor recreation participation with those of environmental concern or sensitivity. The other group took an open-ended approach by asking persons, usually those with pro-environmental attitudes, to identify "significant life experiences" that contributed to their environmental sensitivity. While the latter group generally found outdoor experiences influential on ES, the former group had mixed findings regarding the relationship. Even those reporting a significant relationship acknowledged the relationship was not strong. More recently, some researchers have recognized the variety and complexity of outdoor recreation experiences and have begun to explore the relationship of environmental sensitivity and such qualities of recreation experiences as "types of participation," "experience preferences," and, in the present study, "recreation setting preferences."

### **Purpose**

The purpose of this study was to determine if persons with differing levels of environmental sensitivity have different setting preferences when participating in outdoor recreation activities. It was hypothesized that groups with higher ES would be more likely to prefer settings

characterized by a greater *degree of naturalness*, less *evidence of other users*, infrequent *contact with other people*, and without *nearness to roads*.

## Methods

### *Design*

This study utilized both a post hoc, causal comparative design and a basic correlational design. Complementing the earlier work by Bustam, Young, and Todd (2003, 2005), which compared three groups with differing levels of ES regarding preferences for outdoor recreation as youths and adults and regarding outdoor recreation experience preferences, this study compared ES groups on their recreation setting preferences. Although such causal comparative designs mimic the language and analysis of experimental and quasi-experimental designs, their results often leave one wondering about “cause” and “effect.” Differences found between compared groups usually reflect an underlying relationship between the variables. Hence this study will also present a basic correlational analysis of ES and the setting preferences of participants.

### *Sample*

Participants were 82 upperclassmen and graduate students majoring in recreation and leisure studies at a university in the northeastern United States. All graduate and undergraduate (upper level) recreation and leisure studies students (114) were selected as potential subjects for this research. Based on attendance on the day of the survey administration, consent, and usability of completed surveys, 82 (71.9%) individuals comprised the final sample for this study. The data were collected during five separate class sessions held in the spring of 2001. While convenient and seemingly undesirably homogeneous, this group was of interest because they were almost evenly divided among three concentrations (i.e., outdoor recreation/education, therapeutic recreation, and management). Environmental sensitivity was expected to be varied across the concentrations, resulting in dividable ES groupings.

### *Instrumentation*

Participants completed an instrument that included sections measuring ES, self-claimed influences on ES, recreation activity preferences, outdoor recreation experience preferences, and outdoor recreation setting preferences. Only the sections measuring ES and setting preferences were relevant to the present examination.

Environmental sensitivity was measured according to Peterson’s (1982) method of presenting a definition of ES, i.e.,

Environmental sensitivity is a personal caring or valuing of the natural environment. A person who is empathetic toward nature, who feels a caring connection between him/herself and nature, is environmentally sensitive. For example, a person who is sensitive to the environment would feel personal sadness, dismay or pain when witnessing someone needlessly cutting down a tree, purposefully destroying wildlife, polluting water, or polluting the air (in Peterson, 1982, as cited by Bustam, 2004, p. 116).

After considering that definition, participants were asked to indicate their level of ES on a 9-point scale, ranging from “very low” to “very high.” As in Peterson’s research, this study sought to determine potential influences on people’s differing levels of environmental sensitivity, thus

Peterson's measurement of ES was chosen. Other measurements of environmental sensitivity were considered, such as the New Environmental Paradigm that differentiated between eco and anthropocentric viewpoints, but were not selected for this study because they did not facilitate differentiation among levels of ES. Peterson's measure also lends itself to correlational analysis, which was used to supplement the group comparisons.

Items measuring setting preferences were obtained directly from Virden and Knopf (1989) who operationalized eight dimensions of recreation settings by the USDA Forest Service ROS User's Guide (1983). For each of these eight setting dimensions, descriptors were provided for the six ROS land classes. These descriptors were paraphrased from the Forest Service ROS User's Guide (1983). For example, the six descriptors for the "nearness to roads" dimension included: further than 3 miles (primitive), at least one-half mile from any road (semi-primitive non-motorized), within one-half mile of unimproved roads (semi-primitive motorized), within one-half mile of improved roads (roaded-natural), with scattered improved roads in close proximity (rural), and surrounded with improved roads in close proximity (urban). Only four of the eight setting dimensions used by Virden and Knopf (1989) were included in the research instrument (i.e., "degree of naturalness," "evidence of other users," "amount of contact with other people," "nearness to roads"). The remaining four dimensions (i.e., "amount of management or use regulation," "amount of developed facilities," "amount of multiple-use land management," and "amount of motorized use") seemed less relevant or necessary for the purpose of this study.

Several professors with expertise relevant to the topic and method of study reviewed the instrument for face validity. The internal consistency of items measuring setting preferences was measured using Cronbach's alpha ( $\alpha = .78$ ). Test-retest reliability was also established for setting preferences ( $r = .62$ ,  $p = .008$ ) and for environmental sensitivity ( $r = .67$ ,  $p = .003$ ) during a pilot study with 17 individuals.

Although principally undertaken to assess test-retest reliability, the pilot study also afforded the researchers a chance to identify aspects of the instrument that remained troublesome. The sample was comprised entirely of students, corresponding with the sample to be surveyed. The same 17 individuals were administered the same instrument four weeks later. Based on the reactions of the pilot test respondents, no further refinements were needed to the instrument.

Data were analyzed using SPSS-PC versions 9 and 10. Frequency distributions were generated for ES and setting preference scores. In addition, one-way analysis of variance with post-hoc Tukey (HSD) was used to compare ES groups on the basis of outdoor recreation setting preferences. Pearson correlations were used to measure the relationship between environmental sensitivity and the four setting preference variables.

## Results

### *Demographic Findings*

Eighty-two participants comprised the sample, of which nearly two-thirds (51) were female. Although most respondents were 21-30 years of age, nearly 20% were between 31 and 60. As expected, they were almost evenly divided among three academic concentrations within their recreation majors: outdoor recreation/education (35.2%), therapeutic recreation (33.8%), and



management (31%). Almost half were graduate students, the remainder almost all juniors and seniors.

### *Environmental Sensitivity*

As described above, participants rated their level of ES on a 9-point Likert scale. With only one response below 5 and an average score of 7.04 (SD = 1.24), the distribution was negatively skewed, raising questions of socially desirable responses similar to those found by Place and Ewert (2004). When faced with a skewed distribution of responses for his ES measurement, Peterson (1982) formed comparison groups as follows: 1-2 *very low*, 3-4 *low*, 5-6 *moderate*, 7 *high*, and 8-9 *very high*. For this study, three groups were created to capture approximately equal intervals and named to reflect Peterson's nomenclature: those who rated their level of ES between 1 and 6 formed the *low-moderate ES* group (n = 21); those rated 7 formed the *high ES* group (n = 36); and those rated between 8 and 9 formed the *very high ES* group (n = 26). (See Table 1.)

TABLE 1  
*Frequency Distribution of Level of  
Environmental Sensitivity in Formed Groups*

Level of Environmental Sensitivity (ES score)	Frequency	Valid Percent
Low-moderate (1-6)	20	24.3
High (7)	36	43.9
Very High (8-9)	26	31.7
Total	82	100.0

### *Outdoor Recreation Setting Preferences*

Each of the four setting dimensions contained six verbal descriptors that depicted the six segments of the ROS ranging from "primitive" (1) to "urban" (6). Subjects were asked to think about doing one of their most preferred outdoor recreation activities and then to choose a setting descriptor they most preferred for each setting dimension.

In Table 2, each of the four setting preferences (SP) dimensions are presented. For each SP dimension, Table 2 provides the mean score for all subjects and the mean score for each environmental sensitivity (ES) group. Overall, mean scores tended to fall in the "semi-primitive non-motorized" range: *degree of naturalness* ( $\bar{x} = 2.27$ ), *evidence of other users* ( $\bar{x} = 2.28$ ), *contact with other people* ( $\bar{x} = 2.23$ ), *nearness to roads* ( $\bar{x} = 2.45$ ).

When comparing the mean SP scores by ES grouping using one-way ANOVA and Tukey's HSD test, significant differences were found for three of the four setting dimensions. For each setting

dimension, the very high ES group had a greater preference for “primitive” settings than any other environmental sensitivity group.

Regarding *degree of naturalness*, the low-moderate ES group ( $\bar{x} = 3.16$  or semi-primitive motorized) significantly differed from the high and very high environmental sensitivity groups, which preferred “semi-primitive-non-motorized” ( $\bar{x} = 2.29$ ) and “primitive” ( $\bar{x} = 1.54$ ) settings, respectively ( $F = 9.954, p = .000$ ). The setting dimension, *evidence of other users*, maintained significant differences between the very high ES group’s preference for primitive settings ( $\bar{x} = 1.71$ ) and the high ES ( $\bar{x} = 2.45$ ) and low-moderate ES ( $\bar{x} = 2.74$ ) groups’ preferences for semi-primitive-non-motorized settings ( $F = 6.244, p = .003$ ). Regarding *nearness to roads*, the very high and the low-moderate environmental sensitivity groups differed ( $F = 4.266, p = .018$ ). The very high group showed a “primitive” to “semi-primitive-non-motorized” preference ( $\bar{x} = 1.92$ ), while the low-moderate group preferred a “semi-primitive motorized” setting ( $\bar{x} = 3.05$ ). ES groups did not differ in regards to how much *contact with other users* they preferred in outdoor recreation settings ( $F = 2.982, p = .057$ ).

TABLE 2  
*Outdoor Recreation Setting Preferences: One-way Analysis of Variance Using Mean Scores of Respondents with Different Levels of Environmental Sensitivity*

ROS Setting Dimensions	Total (N=82)	Level of Environmental Sensitivity			F	p	# of Differences Detected
		Low-Moderate (n=20)	High (n=36)	Very High (n=26)			
Degree of naturalness	2.27	3.16 <sup>a</sup>	2.29 <sup>b</sup>	1.54 <sup>b</sup>	9.954	.000	2
Evidence of other users	2.28	2.74 <sup>b</sup>	2.45 <sup>b</sup>	1.71 <sup>a</sup>	6.244	.003	2
Contact with other people	2.23	2.58	2.39	1.75	2.982	.057	n.s.
Nearness to Roads	2.45	3.05 <sup>a</sup>	2.48 <sup>ab</sup>	1.92 <sup>b</sup>	4.266	.018	1

*Note.* Means with different superscripts are significantly different ( $p < .05$ ). Values are mean scores on a 6-point scale ranging from primitive ROS settings (1) to urban ROS settings (6).

To supplement ANOVA comparisons, Pearson correlations examined the relationship between the raw scaled environmental sensitivity scores and each of the setting variables. All correlations were moderate, ranging between  $-.35$  and  $-.39$  as follows: degree of naturalness ( $r = -.39, p < .001$ ); evidence of other users ( $r = -.38, p = .001$ ); contact with other people ( $r = -.36, p = .001$ ); and nearness to roads ( $r = -.35, p = .002$ ). It is interesting to note that even though ES groups did not differ on the setting preference for contact with other people, those variables were significantly correlated and at a magnitude similar to the other variables. In this case, the ES groupings used in the one-way ANOVA masked this relationship. However, in the other three

situations, one-way ANOVA was able to detect and better describe where significant differences emerged along the continuum of raw scores. While the general trend showed that increasing ES was related to increasing preference for primitive settings, all three ES groups did not differ significantly from each other. Instead, one group at the extreme tended to differ from the other two (e.g., low-moderates for degree of naturalness, and very-highs for evidence of other users).

### Summary and Discussion

Past research on environmental sensitivity (ES) has traveled a long road toward understanding the influential factors of ES. This study was inspired by these past travels in research and attempted to provide insight into what underlies ES. Earlier research often speculated an association between outdoor recreation and the development of ES. Yet findings were inconsistent, and established relationships were weak. Since “outdoor recreation” can be or mean many things to different people, the character of outdoor recreation experiences needs clarification and further investigation. This study sought to determine if people with different levels of environmental sensitivity differ in the outdoor recreation settings they prefer. From the recreation literature, four “setting preferences” dimensions (each with six descriptors) were selected as instrument items. Three groups with differing levels of environmental sensitivity were formed. The setting preferences of the three ES groups were compared. On three of the four setting preference dimensions, ES groups differed significantly.

In the setting preference dimensions where differences were found between ES groups, the low-moderate ES group tended to prefer less primitive settings than the high and very high ES groups. Thus the findings support the conclusion that persons with higher levels of ES more strongly favor primitive outdoor recreation settings characterized by a greater *degree of naturalness*, less *evidence of other users*, and without *nearness to roads*. The one setting dimension without significant differences detected, *contact with other people*, could be attributed to the personalities of the sample. As the population consisted of recreation majors, typically a gregarious lot, their desire to be with others might have been greater than their setting preference. It is important to note, however, that raw ES scores were negatively, though moderately, correlated with setting preferences. In this case, the groupings masked this relationship, again perhaps due to the variability in personalities within each group.

Important to consider are the limitations of this study. The small sample size and narrow sample of graduate and upper-level undergraduate students majoring in recreation could be a limitation to the findings. A replication of this study with a larger and more representative population may produce different results. In addition, the single measure of environmental sensitivity questions the confidence in this measurement for each individual, especially respondents’ inclination toward socially acceptable answers – a probable explanation for the negatively skewed distribution. As was shown in the literature review, environmental sensitivity has been measured in numerous ways, none without problems.

Nevertheless, the findings offer directions for further research in the area of ES. First, in concordance with Place and Ewert (2004), better measures of ES are needed. This study used a different measurement of ES (i.e., Peterson’s (1982) measurement) than Place and Ewert (i.e., NEP), yet both had a remarkably high percentage of participants scoring in the upper range pro-environment spectrum. Theodori et al. (1998) suggested a behavioral approach to measure

environmental concern, and their idea has merit. Second, other characteristics of outdoor recreation participation should be investigated and compared with ES, such as experience preferences or desired consequences, motivations, activity type, and level of specialization. Third, when looking at the relationship of adult outdoor recreation characteristics (e.g., setting preferences, experience preferences) and ES, it is difficult by research design or theory to know if one contributed to the other (or vice versa) or if both are the product of some other formative influences. Answers to those questions are important to improve outdoor/environmental education practice. Fourth, more studies of this kind are needed with varied and larger samples. This study's sample included students concentrating in outdoor recreation/education whose setting preferences may have been dependent on their major and thus may not be typical of others with the same level of ES.

The results of this investigation provide practical implications for outdoor recreation and environmental educators in program development. Up to this point, the focus of environmental education has been on producing environmentally responsible citizens to act on behalf of the environment. Although nurturing environmental sensitivity has long been regarded as an important step in that process, how to foster such regard has not been clear. In conjunction with other studies, this study suggests that, in order to support the development of environmental sensitivity, individuals need to be encouraged as youths to participate in outdoor recreation activities that take place in settings with a natural or rustic character. These are the elements that may promote a concern for the environment and a will to act in support of its protection.

For the research community, this study confirms suggestions that the character of outdoor recreation experiences, not just the quantity of participation, needs to be considered when exploring the relationship between outdoor recreation and environmental sensitivity. For 25 years, researchers persisted in exploring the Dunlap and Heffernan hypothesis, only to find repeatedly that the relationship between outdoor recreation and ES was weak. During that same period, recreation researchers were finding a rich variety of factors that shape the character of outdoor recreation experiences. Only recently have environmental sensitivity researchers begun to include the character of recreation experiences in their studies of recreation and ES. This study, which found a moderate relationship between recreation setting preferences and ES, is a very small step in the new direction ES research is taking. Small steps and moderate relationships are promising after decades of weak relationships.

Understanding formative or sustaining influences on environmental sensitivity is an important topic to the field of environmental education and beyond. Maintaining a resource rich planet for future generations affects us all. Regardless that past studies found outdoor recreation experiences, especially during youth, are related to ES (albeit weakly), still more investigation is needed, specifically on the character of the outdoor recreation experience. In this study, groups with higher levels of ES differed from the lower ES group in the kinds of settings they seek during outdoor recreation participation. Further research on the character of outdoor recreation might strengthen our understanding of what underlies ES, provide us with the knowledge to foster the development of environmental sensitivity and fulfill the ultimate aim of environmental education, for the good of us all.

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