

## THE ASSOCIATION OF OUTDOOR RECREATION AND ENVIRONMENTAL BEHAVIORS<sup>1</sup>

Gene L. Theodori

Research Assistant, Department of Agricultural Economics and Rural Sociology, The Pennsylvania State University, Armsby Building, University Park, PA 16802

A.E. Luloff

Professor, Department of Agricultural Economics and Rural Sociology, The Pennsylvania State University, Armsby Building, University Park, PA 16802

Fern K. Willits

Professor, Department of Agricultural Economics and Rural Sociology, The Pennsylvania State University, Armsby Building, University Park, PA 16802

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**Abstract:** Building upon earlier studies, two hypotheses concerning the association between participation in outdoor recreational activities and pro-environmental behavior are tested using data collected in a general population survey from a random sample of individuals in four communities in Pennsylvania. The first hypothesis, that there is a positive association between outdoor recreational participation and pro-environmental behavior, received substantial support. In contrast to previous research, the results did not support the second hypothesis which stated that there will be differences between/among different types of outdoor activities with respect to their impact on pro-environmental behaviors.

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### Introduction

Utilizing data collected in 1970 from a Washington survey, Dunlap and Heffernan (1975) explored the issue of whether involvement in outdoor recreation activities increased environmental concern among the general public. In their study, Dunlap and Heffernan tested three hypotheses. First, they hypothesized that involvement in outdoor recreation was positively associated with environmental concern. Second, they hypothesized that involvement in appreciative activities (i.e., hiking, camping, and visiting state parks and scenic areas) was more strongly associated with environmental concern than involvement in consumptive activities (i.e., hunting and fishing). And third, they hypothesized that the association between outdoor recreation involvement and protecting those aspects of the environment necessary for pursuing such activities was stronger than the association between outdoor recreation and other environmental issues such as air and water pollution.

Results indicated mixed and generally weak support for their first hypothesis, modest support for their second hypothesis, and somewhat stronger support for their third. In order to check for spuriousness, Dunlap and Heffernan examined the relationships while controlling for five demographic variables—age, gender, residence, education, and income. Although their correlations were slightly weakened, Dunlap and Heffernan found no loss of

significance. Hence, they concluded that “there is a nonspurious relationship between involvement in outdoor recreational activities (especially appreciative activities) and environmental concern” (25). Although they noted that the association between outdoor recreation participation and environmental concern needed further investigation, they argued, based on their results, that outdoor recreationists constituted a potential constituency for environmental activists.

Since their initial analysis, several other researchers (e.g., Geisler et al. 1977; Pinhey and Grimes 1979; Van Liere and Noe 1981; Jackson 1986; Nord et al. 1998) have examined the associations between participation in outdoor recreational activities and attitudes toward the environment. The overall findings of these studies have been far from consistent. In these previous studies, concern for the environment was measured by attitudinal indicators. Research has consistently shown, however, that the links between environmental attitudes and behavior are, at best, weak (Hines et al. 1987; Oskamp et al. 1991; Scott and Willits 1994; Weigel et al. 1974; but see Guagnano et al. 1995; Vogel 1996). It may be the case that participation in outdoor recreational activities leads to pro-environmental behaviors regardless of whether or not it leads to measurable pro-environmental attitudes.

The present research is a further examination of the association between participation in outdoor recreational activities and environmental concern. The purpose of this paper is to report results from a study of the association between participation in outdoor recreational activities and a stronger measure of environmental concern—*pro-environmental behavior*. Building upon previous studies, the following two hypotheses were tested. First, it was hypothesized that there is a positive association between outdoor recreational participation and pro-environmental behavior. The second hypothesis was that there will be differences between/among different types of activities with respect to their impact on pro-environmental behaviors.

### Data and measurement

Data were collected in a general population survey from a random sample of individuals in four agricultural communities at the rural-urban interface in Pennsylvania (see Luloff et al. 1995). Study sites were selected based on an empirical classification of every municipality in the Commonwealth with respect to the level of agricultural presence, rurality, and growth. Each municipality was ranked according to its population size, population growth (1980-1990), migration rate (1980-1990), percent of housing unit change (1980-1990), percent of land in agriculture, percent urban population, and proportion employed in agricultural occupations. From these statistical rankings, four sites were selected to represent a typology of increasing levels of urban presence and pressure in agricultural areas. The sites chosen for in-depth study included an aggregate of minor civil divisions from each of the following four counties: Lancaster, Crawford, Snyder, and Bedford.<sup>2</sup>

Based on major issues identified in key and action informant interviews in each study site, a questionnaire was

developed which addressed land use, agricultural, development, and natural resource issues, in addition to social issues including community attachment, community ties, community participation, community leadership, and stress. Following a modified Total Design Method (see Dillman 1978; Luloff and Ilvento 1981), data were gathered in the Snyder, Crawford, and Bedford sites using mail survey techniques. However, due to the presence of a substantial number of Old Order Amish and Mennonites in the Lancaster community, data were collected via a questionnaire drop-off/pick-up procedure. Overall, a response rate of 51% was achieved, resulting in 1,491 completed questionnaires across the four sites.

*Measuring pro-environmental behavior*

Respondents were presented with a list of seven yes/no items which asked if during the past year they had engaged in any of the following behaviors: (1) contributed money or time to an environmental or wildlife conservation group, (2) stopped buying a product because it caused environmental problems, (3) attended a public hearing or meeting about the environment, (4) contacted a government agency to get information or complain about an environmental problem, (5) read a conservation or environmental magazine, (6) watched a television special on the environment, and (7) voted for or against a political candidate because of his/her position on the environment. Responses were scored as either zero or 1, with zero indicating that the individual had not performed the behavior and 1 indicating the individual had performed the behavior. A composite score was calculated by summing the scores for the individual items. High scores reflected high levels of pro-environmental behavior; low scores indicated low levels of pro-environmental behavior. Results of a preliminary principal axis factor analysis with oblique rotation revealed that these measures of environmental behaviors were unidimensional.<sup>3</sup> Cronbach's alpha for this pro-environmental behavior scale was 0.66.

*Measuring outdoor recreational participation*

Outdoor recreational participation was assessed using a list of nine outdoor recreation activities. Respondents were asked whether they engaged in (1) picnicking, (2) camping, (3) birdwatching, (4) hiking/backpacking, (5) mountain biking, (6) skiing (downhill or cross-country), (7) fishing, (8) hunting, and/or (9) riding off-road vehicles.<sup>4</sup> The most popular outdoor activity was picnicking, while mountain biking tended to be the least popular. Approximately 88 percent of the respondents had picnicked within the previous year, while less than 10 percent mountain biked. Each outdoor activity was dummy coded (where 1 = yes and zero = no).

**Results**

As in previous research, the relationships between outdoor recreational activities and pro-environmental behavior were assessed using bivariate and multivariate correlation/regression. As noted in Table 1, there was considerable support at the zero-order level for the proposition that participation in outdoor recreational activities is associated with pro-environmental behavior. All nine bivariate relationships were positive and statistically significant at the 0.05 level; all but two were significant at the 0.001 level. The second hypothesis, that there are differences between/among different types of outdoor activities regarding their effect on pro-environmental behaviors, received mixed support at the zero-order level. With the exception of fishing, as noted in Table 1, the associations between the appreciative to slight resource-utilization activities and pro-environmental behaviors were consistently higher than those for hunting and riding off-road vehicles and pro-environmental behaviors. The association between fishing and pro-environmental behaviors was stronger than the associations between three appreciative to slight resource-utilization activities—picnicking, mountain biking, and skiing—and pro-environmental behaviors.

Table 1. Zero-order and partial correlations between outdoor recreational participation and pro-environmental behavior

Outdoor recreational activities	Pro-environmental behavior		
	N	Zero-order	Partial correlation
<b>Appreciative to slight resource-utilization activities</b>			
Picnicking	921	.130	.111
Camping	892	.185	.174
Birdwatching	884	.262	.250
Hiking/backpacking	881	.247	.213
Mountain biking	867	.152	.113
*Skiing (downhill or cross-country)	867	.172	.114
<b>Moderate-to-intensive resource-utilization activities</b>			
Fishing	889	.183	.190
Hunting	880	.074	.131
Riding off-road vehicles	834	.079	.102

<sup>a</sup> Partial correlations were computed controlling for age, education, gender, income, and political ideology; Ns vary due to frequency of participation.

\* Significant at the .05 level.

\*\* Significant at the .01 level.

\*\*\* Significant at the .001 level.

Although the bivariate relationships were positive and statistically significant, the  $r$  values were not strong. Based on previous studies, however, low correlations were anticipated. Despite the somewhat weak associations, overall the correlation coefficients and their corresponding  $r^2$  values were more consistent and stronger, respectively, than has been previously documented.

#### *Controlling for spuriousness*

Following these earlier studies, tests for spuriousness using partial correlations were also conducted. As in previous research, age, education, gender, and income were included as control factors. Political ideology, a measure that has shown consistent association with environmental concern (see Van Liere and Dunlap 1980), also was included as a control variable. Age was measured in years. Education was scored as follows: (1) less than high school, (2) high school equivalent, (3) some college, (4) college degree, and (5) training beyond college. Gender was dummy coded, with zero = males and 1 = females. Income was measured by the categories: (1) less than \$9,999, (2) \$10,000 - \$14,999, (3) \$15,000 - \$19,999, (4) \$20,000 - \$24,999, (5) \$25,000 - \$29,999, (6) \$30,000 - \$39,999, (7) \$40,000 - \$49,999, (8) \$50,000 - \$59,999, and (9) \$60,000 and over. Political ideology was coded: (1) liberal, (2) moderate-liberal, (3) moderate, (4) moderate-conservative, and (5) conservative.

As noted in Table 1, the results indicated that controlling for these sociodemographic variables had very little effect on the size of the correlation coefficients. Indeed, holding constant the effects of age, education, gender, income, and political ideology, the variance explained by three moderate-to-intensive resource-utilization activities—fishing, hunting, and riding off-road vehicles—was slightly higher than in the bivariate case. Overall, the results provided support for Dunlap and Heffernan's (1975), Van Liere and Noe's (1981), and Jackson's (1986) assertion that the relationships between outdoor recreational participation and environmental concern are not spurious.

Of the control variables, age, gender, and income consistently failed to reach statistical significance. Education was positively and significantly ( $p < 0.001$ ) related to pro-environmental behavior for each of the outdoor activities. Higher educated persons were significantly more likely than lower educated persons to engage in environmental behaviors. Moreover, political ideology was significantly ( $p < 0.001$ ) related to pro-environmental behavior for each of the outdoor activities when the effects of the other variables in the model were controlled. Politically liberal individuals were more likely than their politically conservative counterparts to engage in pro-environmental behaviors.

#### *The second hypothesis reconsidered*

As noted in Table 1, participation in each of the outdoor recreational activities was positively and significantly related to pro-environmental behavior when considered individually, thus providing strong support for the first

hypothesis. Furthermore, the second hypothesis (that there are differences between/among different types of outdoor activities regarding their impact on pro-environmental behaviors) received mixed support in both the bivariate and partial correlation analysis. However, this finding may be misleading.

The above analysis and several previous analyses failed to take into consideration the fact that recreationists may engage in more than one outdoor activity (e.g., Dunlap and Heffernan 1975; Geisler et al. 1977; Van Liere and Noe 1981). Thus, while theoretically possible to compare the correlations for the relationships between participation in appreciative to slight resource-utilization activities and pro-environmental behavior with those for the relationships between participation in moderate-to-intensive resource-utilization activities and pro-environmental behavior, both realistically and statistically this procedure is questionable. That is, it is reasonable to expect that a proportion of participants could be expected to participate in at least one activity from both categories.

A more comprehensive test of the second hypothesis would be to compare the pro-environmental behaviors of the respondents who participated solely in one or more of the appreciative to slight resource-utilization activities with the pro-environmental behaviors of those who participated solely in one or more moderate-to-intensive resource-utilization activities. Thus, respondents who participated in at least one outdoor activity from both categories would be excluded from such an analysis. Unfortunately, these data suggested that such a test was not feasible. Here, approximately 64 percent of the outdoor recreation participants indicated that they engaged in at least one appreciative to slight resource-utilization activity *and* at least one moderate-to-intensive resource-utilization activity. Less than 2 percent of the respondents participated *solely* in one or more of the moderate-to-intensive resource-utilization activities, while approximately 35 percent of the respondents engaged *exclusively* in one or more of the appreciative to slight resource-utilization activities.

Therefore, to further explore the second hypothesis, a more appropriate test that examined participation in specific outdoor activities individually was conducted using correlation/regression techniques. Similar to procedures utilized by Jackson (1986), each appreciative to slight resource-utilization activity was paired with each moderate-to-intensive resource-utilization activity. For each of the 18 possible pairs of outdoor activities, the pro-environmental behaviors of the respondents who participated in the appreciative to slight resource-utilization activity and *not* in the moderate-to-intensive resource-utilization activity were compared with the pro-environmental behaviors of the respondents who participated in the moderate-to-intensive resource-utilization activity and *not* in the appreciative to slight resource-utilization activity.

The analysis was conducted by creating 18 dummy variables (Table 2). The first activity was coded zero and the second as 1. Each pair of activities was entered individually into a regression model, with age, education, gender, income, and political ideology as control variables. As noted in Table 2, the results of the bivariate analysis indicated that the difference between eight of the eighteen

pairs of outdoor recreational activities was statistically significant. Individuals who engaged in the appreciative to slight resource-utilization activity and not in the moderate-to-intensive resource-utilization activity were significantly ( $p < 0.05$ ) more likely to perform pro-environmental behaviors.

Table 2. Zero-order and partial correlations between recreational participation in exclusive outdoor activity pairs and pro-environmental behavior<sup>a</sup>

Exclusive outdoor activity pairs	N	Pro-environmental behavior	
		Zero-order	Partial correlation
Picnicking -- Fishing	392	.000	.001
Picnicking -- Hunting	485	-.048	-.006
Picnicking -- Riding off-road vehicles	605	-.052	-.039
Camping -- Fishing	289	.004	.025
Camping -- Hunting	360	-.111*	-.014
Camping -- Riding off-road vehicles	337	-.034	-.021
Birdwatching -- Fishing	350	-.121*	-.060
Birdwatching -- Hunting	390	-.215***	-.077
Birdwatching -- Riding off-road vehicles	350	-.132*	-.069
Hiking/backpacking -- Fishing	332	-.091	-.013
Hiking/backpacking -- Hunting	361	-.204***	-.075
Hiking/backpacking -- Riding off-road vehicles	314	-.128*	-.060
Mountain biking -- Fishing	385	-.021	.036
Mountain biking -- Hunting	325	-.097	-.010
Mountain biking -- Riding off-road vehicles	163	-.171*	-.037
Skiing -- Fishing	392	-.083	-.024
Skiing -- Hunting	359	-.140**	-.037
Skiing -- Riding off-road vehicles	211	-.107	.023

<sup>a</sup> Partial correlations were computed controlling for age, education, gender, income and political ideology; Ns vary due to frequency of participation.

\* Significant at the .05 level.

\*\* Significant at the .01 level.

\*\*\* Significant at the .001 level.

As indicated by the partial correlation coefficients, all of the statistically significant zero-order correlation coefficients dropped to nonsignificance when the effects of age, education, gender, income, and political ideology were controlled. In short, the partial correlation analysis of the paired-activity comparisons indicated that there was no significance difference between individuals who engaged in appreciative to slight resource-utilization activities and those who engaged in moderate-to-intensive resource-utilization activities regarding pro-environmental behaviors.

### Conclusion

The results of this study indicated that participation in outdoor recreational activities was positively associated with pro-environmental behaviors. Furthermore, these associations changed only slightly when sociodemographic characteristics were controlled. Although the total explained variances of the recreational activities were small, they did not differ substantially from social and demographic variables, such as education and political ideology, that have been shown elsewhere to be associated with environmental concern. Thus, these data provided

substantial support for the first hypothesis of the study, namely, that there is a positive association between outdoor recreational participation and pro-environmental behavior.

The application of a more appropriate form of analysis that examined participation in specific outdoor activities individually did not find support for Dunlap and Heffernan's (1975) second original hypothesis that consumptive activities (moderate-to-intensive resource-utilization activities) are less strongly correlated with environmental concern. The bivariate results of the paired exclusive outdoor recreational activities analysis indicated that the difference between participants in appreciative to slight resource-utilization activities and participants in moderate-to-intensive resource-utilization activities regarding pro-environmental behaviors was significant in slightly less than 50 percent of the possible 18 combinations. When the effects of age, education, gender, income, and political ideology were controlled, all of the statistically significant associations dropped to nonsignificance. Thus, the data do not support the second hypothesis. Recreationists who engaged in an appreciative to slight resource-utilization activity but *not* in a moderate-

to-intensive resource-utilization activity did not differ significantly in regard to pro-environmental behavior from those who engage in a latter type of activity but *not* a former type of activity. Further research examining the associations among non-participants, participants in either the appreciative to slight resource-utilization group or the moderate-to-intensive resource-utilization group, and those who participate in both in regard to environmental behavior is warranted.

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#### Footnotes

<sup>1</sup> Support for this research was provided by the Pennsylvania Department of Agriculture (ME 442152) and the Pennsylvania Agricultural Experiment Station (Regional Project NE-173 and State Station Project 3548). For a more detailed discussion of the ideas contained within this paper, see Theodori et al. (1998).

<sup>2</sup> For a detailed description of the typology and site selections, see Luloff et al. (1995).

<sup>3</sup> In principal, three of the items could indicate anti- rather than pro-environmental behavior. Respondents could have attended a meeting, contacted a government agency, or voted for a candidate to *prevent*, rather than promote environmental protection. However, the correlation of these variables with unambiguously pro-environmental behaviors indicated that such intentions were rare.

<sup>4</sup> A preliminary principal axis analysis of the outdoor recreation activities revealed that there were two factors. After oblique rotation to final solution, the outdoor recreational activities were organized into two conceptual categories: (1) appreciative to slight resource-utilization, and (2) moderate-to-intensive resource-utilization. Appreciative to slight resource-utilization activities included: picnicking, camping, birdwatching, hiking/backpacking, mountain biking, and skiing. Fishing, hunting, and riding off-road vehicles comprised the moderate-to-intensive resource-utilization activities group.