Visitation to Natural Areas on Campus and its Relation to Place Identity and Environmentally Responsible Behaviors

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<th>The Journal of Environmental Education</th>
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<td>02-10-042</td>
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<tr>
<td>Manuscript Type:</td>
<td>Original Research</td>
</tr>
<tr>
<td>Keywords:</td>
<td>environmentally responsible behavior, nature experience, place identity</td>
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Visitation to Natural Areas on Campus and its Relation to Place Identity and Environmentally Responsible Behaviors
VISITING NATURAL AREAS ON CAMPUS

Abstract

This study examined college students’ visits to natural areas on campus and how these visits relate to place identity and environmentally responsible behaviors. The majority (76.5%) of the 115 participants reported visiting the natural areas on campus, and 55.7% of these students visited for a course requirement. Students who lived on campus, were younger, and majored in environmental studies, humanities, or arts made more frequent visits. Among those who had visited the natural areas (n = 88), both visitation frequency and having visited for a course requirement was related to place identity and environmentally responsible behaviors. Place identity mediated the relationship between visiting for a course requirement and environmental behaviors, but did not appear to mediate the impact of visitation frequency.

Keywords: environmentally responsible behavior, nature experience, place identity
There is a wealth of both theoretical support and empirical evidence that contact with nature has benefits for the individual and community. The biophilia hypothesis suggests that humans have an innate need to affiliate with other species and the natural world in general (Wilson, 1984; Kellert & Wilson, 1993). Because we have spent the majority of our evolutionary history living in close contact with nature, we seem to be attracted to places with natural features and living without nature contact may have detrimental effects (Sullivan, 2005). Empirical research in this area suggests that nature contact leads to improved physical health (Takano, Nakamura, & Watanabe, 2002; Ulrich, 1984), psychological restoration (Kaplan & Kaplan, 1995; Ryan, Weinstein, Bernstein, Warren Brown, Mistretta, & Gagne, 2010), improved attention (Faber Taylor, Kuo, & Sullivan, 2001), increased self-confidence (Kaplan & Talbot, 1983), and decreased aggression and crime (Sullivan, 2005). Additionally, those with personal experiences with natural areas report a deeper and more personal relationship with nature (Kaplan & Talbot, 1983; Loeffler, 2004).

Not only do nature experiences benefit humans, but there seems to be a reciprocal benefit to the environment. Interviews of those who are actively involved in the environmental movement provide support for the importance of outdoor experiences. These environmentalists consistently name extended time spent outdoors as one of their primary motivators to protect the natural world (Chawla, 1999; Ewert, Place, & Sibthorp, 2005; Tanner, 1980). In Chawla’s study, experience of natural areas was the most frequently named source of environmental commitment with 77 percent of environmentalists identifying this factor. Although the memories
of environmentalists may be biased by current experiences, these findings lend support for environmental education programs that provide individuals with direct contact with natural areas.

One of the foundations to outdoor education programs is the belief that exposure to nature will enhance the participants’ responsibility toward the natural world (Jackson, 1987). Outdoor experiential education can change the way the participants think about and see the natural world, modify environmental attitudes, and build personal skills (Phipps, 1988). Furthermore, teaching environmental education with an outdoor component may help to impact participants’ motivation by giving them a specific environmental context (Phipps, 1988), and such motivation is one of the cornerstones to environmentally responsible behaviors (Oskamp, 2002).

Environmental education programs often focus on children, and there is good evidence of the efficacy of this focus. Environmentalists who reported experiences of nature as being a key motivator often describe childhood experiences as foundational (Chawla, 1999; Ewert et al., 2005). Empirical research on child-focused environmental education programs reveal that outdoor activities can serve as a basis for environmentally responsible behaviors (Palmberg & Kuru, 2000; Vaske & Kobrin, 2001). However, Newhouse (1990) suggests that environmental attitudes are formed throughout one’s lifetime and are based on multiple experiences. Thus, adult experiences with nature can help to reinforce or even establish positive environmental perspectives (Bartlett, 2005; Loeffler, 2004).

Increased environmental concern and responsibility is not simply a function of exposure to nature, but rather the specific types of experiences. Phipps (1988) noted that visitors of natural areas can be bored, overwhelmed, or unaware of the important points of the experience if feedback and reflection are not included. Moreover, early research distinguished between
activities that are appreciative such as hiking and camping, consumptive such as hunting and fishing (Dunlap & Heffernan, 1975), and abusive such as snowmobiling and ATV riding (Geisler, Martinson, & Wilkening, 1977). Only participation in appreciative activities was linked to environmental concern (Dunlap & Heffernan; 1975; Geisler et al., 1977). More recently, Teisl and O’Brien (2003) surveyed a representative sample of U.S. adults on the types of outdoor recreational activities they participated in and the subsequent relationship with specific environmental behaviors. They found that appreciative activities of hiking, wildlife watching, nature photography, and camping were most strongly correlated with participation in environmental organizations, interest in forest management, and likelihood of purchasing an environmental product.

Educational and appreciative outdoor activities may impact environmental attitudes and behaviors by shifting our perspective of the natural world and changing our relationship with place. For example, one outdoor program for college students included a variety of appreciative activities (camping, kayaking, and nature photography) and such activities led many participants to a more personal, and sometimes spiritual connection with nature as well as feelings of awe and wonder (Loeffler, 2004). Likewise, faculty participating in the Piedmont Project at Emory University took noon-time nature walks together, as well as attended lectures and participated in discussions. Interviews with faculty revealed that all aspects of the project were beneficial to faculty, but that experiential education embodied in the noon-time walks were foremost on their minds. Faculty reported that their experiences in nature not only provided a retreat, but also helped them to engage with the natural world on a deeper level (Bartlett, 2005).

Natural areas represent more than the physical space they occupy, rather they provide the context for developing personal meaning and a social construction of place (Williams &
Patterson, 1999). People may become attached to particular places, even coming to see a place as a component of their self identity (Proshansky, Fabian, & Kaminof, 1983). Place identity is the term associated with the emotional connections and personal meanings associated with a specific setting. It is more than the functional attachment associated with resources or activities, or the result of any single experience. Rather, place identity represents a psychological investment that develops over time (Cuba & Hummon, 1993; Moore & Graebe, 1994; Proshansky et al., 1983; Vaske & Kobrin, 2001; Williams & Patterson, 1999).

Because of the personal investment associated with place identity, we might assume that it is associated with place-protective attitudes and behaviors. However, research on this topic is sparse and inconsistent (Scannell & Gifford, 2010). In one study, farmers’ ecological management of their properties was related to their general feelings about nature, but not to place-specific attachment (Gosling & Williams, 2010). Uzzell, Pol, and Badenas (2010) found that place identity was related to environmentally sustainable behaviors for residents of one neighborhood, but not another. On the other hand, the extent to which one identifies with a specific natural area has been associated with picking up litter, staying on designated trails, and respecting wildlife within that area (Williams & Patterson, 1999). Vaske and Kobrin (2001) found evidence that identification with a local park generalized to broad environmental activities such as water conservation, recycling, learning about environmental issues, and talking to others about environmental concerns.

Place identification begins with visits to a specific area, and visitation is more likely to occur with near-by and easily accessible places (Kaplan & Kaplan, 1995). College campuses typically include green spaces (i.e., landscaped and natural areas) that offer convenient access to community members, especially those involved with the college (e.g., Hien & Jusef, 2008; Lau
VISITING NATURAL AREAS ON CAMPUS

& Yang, 2009). Spaces left in their natural form such as woods help establish a campus identity, build the college community, connect with alumni, and provide restorative areas for recreation and relaxation (Griffith, 1994). For example, the Piedmont Project highlights the value of natural areas on campus that provided significant experiences for participating faculty (Bartlett, 2005).

College students may similarly benefit from experiences with natural areas on campus, which may lead to place identification and in turn increased responsibility for the natural environment. However, some types of students are more likely to visit natural areas than others. Sherburn and Devlin (2004) found that environmental studies majors were more likely to visit a campus arboretum than other majors. The experience of visiting natural areas on campus may reinforce already existing beliefs by fostering place identification and other pro-environmental beliefs and behaviors. This is particularly true for those who engage in unstructured or self-directed activities. These types of activities can lead to place identification, but organized programs that require time and commitment to a specific place are especially likely to enhance one’s place identity (Cuba & Hummon, 1993) and result in improved environmental responsibility (Phipps, 1988). Therefore, it is important to understand the types of educational experiences that require visitation to natural areas and the potential relationship between such coursework and place identity and environmental behaviors.

This study examines students’ utilization of a campus woods and lake in order to first explore who visits these natural areas on campus, reasons they visit, and what types of courses incorporate visitation as part of the course requirement. Secondly, this study investigates how visitation to natural areas correlates to place identity and environmentally responsible behaviors. Based on the literature linking both repeated and structured experiences with place identity (e.g., Cuba & Hummon, 1993; Moore & Graefe, 1994), I expect that spending more time in natural
areas as well as having taken a course requiring visitation to these areas will be related to
stronger identification with those areas. Given the empirical evidence that outdoor experiences,
especially ones that are appreciative in nature, are linked with positive environmental behaviors
(e.g., Chawla, 1999; Ewert et al., 2005; Teisl & O’Brien, 2003), I expect that both frequency of
visitation and having a course requiring visitation will be correlated with environmentally
responsible behaviors. Moreover, I expect that spending time in natural areas will have a positive
impact even after factoring in demographic variables, academic major, and preferences for
nature. Additionally, having a course requirement will have an impact even when all of these
other factors are taken into account.

Finally, this study contributes to the relatively little and contradictory literature
examining the relationship between place identity and environmentally responsible behaviors.
Unlike past studies that examined place-specific caretaking (e.g., Gosling & Williams, 2010;
Williams & Patterson, 1999), this study is similar to that of Vaske and Kobrin (2001) that
examined how identification with a specific place generalizes to environmentally responsible
behaviors within the community. Vaske and Kobrin examined adolescents who participated in
nature-based work programs and found that identification with the parks in which they worked
was linked to environmentally responsible behaviors. This study, on the other hand, examines
adult college students’ with varying experiences of a specific natural area on campus. I
hypothesize that place identity be linked with general environmentally responsible behaviors
(e.g., recycling, water conservation) for these students, and that place identity will mediate the
relationship between their nature experiences and environmentally responsible behaviors. In
other words, unstructured and structured experiences with the natural areas on campus will
impact environmentally responsible behaviors only if the experiences foster place identity.
Method

Participants

One hundred fifteen undergraduates (27 men; 88 women) at Guilford College participated in this research. Guilford College is a small liberal arts college in Greensboro, North Carolina that has 356 acres of woods fronted by a small lake. This sample consisted of 62 students living on campus and 53 students living off campus. Ages ranged from 18 to 51 ($M = 24.10$, $SD = 8.66$). Students who live off campus have a wider variation in age, but are on average older ($M = 31.53$, $SD = 9.20$) than those who live on campus ($M = 19.61$, $SD = 1.24$), $t (53.63) = -9.35$, $p < .001$, $r_{pb}^2 = .47$.

The majority of the sample was Caucasian (83.3%), with African Americans making up 9.6% of the sample, and the remaining 7.1% indicating that they were Latino/a, Asian, or other. There were 26 first year students (22.6%), 20 sophomores (17.4%), 29 juniors (25.2%), and 40 seniors (34.8%). Participants attended Guilford College between one-half and five years ($M = 2.01$, $SD = 1.33$). There were 38 students majoring in the social sciences (33%), 21 in business (18.3%), 18 in environmental studies (15.7%), 16 in the humanities (13.9%), 8 in art (7%), 7 in the natural sciences or mathematics (6.1%), and 7 undecided (6.1%).

Procedure

An anonymous online survey was emailed to students and advisees of the author. Additionally, a link to the survey was posted to a daily electronic message board that is emailed to all Guilford College students. All potential participants were informed that the study was about their experiences on campus as well as their environmental attitudes and behaviors. They were told that their answers would be both confidential and anonymous and that they could withdraw
at anytime by simply exiting the survey. Students had to acknowledge that they read this information and were at least 18 years old in order to participate in the study.

Measures

Outdoor Experiences. Participants estimated the percentage of their free time spent outdoors each year in order to gauge their preferences for nature. Next, participants indicated how often they visited the lake or woods on Guilford’s campus (never, 1 time a year or less, 2-5 times a year, 6-9 times a year, about every month, a few times a month, every week or more). They were told not to include times they just passed by or through these areas, and were asked to report times that they had spent at least 15 minutes in either or both of the areas. Those who indicated that they had ever visited the lake or woods were asked follow-up questions about time spent at the lake and woods separately. However, the lake and woods are physically connected spaces and the patterns of results were similar for the combined question and those that separated the lake from the woods. Therefore, only the question that combined the lake and woods was used for this study.

Participants who reported that they had ever been to the natural areas on campus (lake or woods) were asked an open-ended question about the reason they visited. Responses were coded based on common themes: enjoying nature (including bird or animal watching, observing flora, and nature photography or art), hiking or walking, being with friends, and academics (studying or doing a course project). These participants were also asked if they ever took a course at Guilford College that required them to spend time at the woods or lake. Those who answered in the affirmative were asked how many courses required a visit to the lake or woods and how many times they visited due to a course requirement (1-3 times, 4-6 times, 7-9 times, 10 times or more).
Students also indicated what type of courses required them to visit the lake or woods and what types of activities the course required.

**Place Identity.** Participants who reported ever visiting natural areas on campus were asked four questions that assessed identification with these areas using a 5-point likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The questions were modified from those used by Vaske and Kobrin (2001): (a) I often think about coming to the lake and/or woods on campus to enjoy the outdoors, (b) I am very attached to the lake and/or woods on Guilford’s campus, (c) I identify strongly with the lake and/or woods on Guilford’s campus, and (d) I feel like the lake and/or woods on Guilford’s campus is a part of me. The internal consistency of this scale was excellent ($\alpha = .89$).

**Environmental Behaviors.** All participants were asked seven items that assessed environmental behaviors based on the Environmentally Responsible Behaviors Inventory (ERB) (Smith-Sebasto & D’Costa, 1995). Participants indicated how often they participated in the following behaviors: (a) learning how to solve environmental issues, (b) talking to peers about environmental issues, (c) talking to parents about environmental issues, (d) joining community clean-up efforts, (e) sorting recyclable trash, (f) trying to convince friends to act in environmentally responsible ways, and (g) conserving water by turning off the tap while washing dishes. The items were rated on a 5-point likert scale from *rarely (10%)* to *usually (90%)* and had demonstrated internal consistency ($\alpha = .88$).

**Results**

**Frequency and Types of Outdoor Experiences**

Participants reported spending anywhere from none to 100% of their leisure time outdoors, with an average of 47.7% ($SD = 20.95$). Twenty-seven participants indicated that they
had never been to the natural areas on campus (23.5%), 17 visited once a year or less (14.8%), 8 visited 2-5 times a year (7%), 15 visited 6-10 times a year (13%), 12 about every month (10.4%), 18 several times a month (15.7%), and 18 visited every week or more (15.7%). Responses were rated from 1 (never) to 7 (every week or more), with a Mean of 3.82 (SD = 2.22).

Most students reported that the primary reason they visited the natural areas was to enjoy nature (69%), followed by walking or hiking (16%). Fewer students reported that being with friends (8%) or academics (6%) was their primary motivator. Forty nine of the 88 (55.7%) who had ever visited the natural areas on campus reported that they had visited at least once for a course requirement. These 49 participants indicated that 1 to 4 of their classes had required visitation ($M = 1.53$, $SD = 0.79$), with one the most common (63%). The majority (86%) of these classes required between one to three visits, 6% required 4 to 6 visits, and 8% required 7 or more visits.

A variety of courses required visits to the natural areas, although no business courses were listed. Sixteen participants reported taking first-year orientation courses that required visitation to the lake or woods, 9 arts, 6 humanities, 22 natural science, 6 social science, 10 environmental studies, and 5 interdisciplinary courses. Course activities likewise varied. Twenty-one participants reported that they hiked and 18 reported participating in an outdoor class discussion. Scientific activities, which included analyzing and identifying natural materials, was another common experience ($n = 19$). Art activities occurred for 9 participants, nature appreciation for 6, and spiritual activities or meditation for 6.

**Who Visits the Natural Areas on Campus?**

Students who live on campus have easier access to the natural areas on campus, and it is not surprising that they make more frequent visits ($M = 4.73$, $SD = 1.87$) than off campus.
students \( (M = 2.75, SD = 2.13) \), \( t (113) = 5.28, p < .001, r_{pb}^2 = .20 \). Age was also significantly correlated with visitation \( (r = -.55, p < .001) \). On the other hand, there were no significant gender differences \( (M_{men} = 3.44, SD = 2.03 \) vs. \( M_{women} = 3.93, SD = 2.27, t (113) = -1.00, p = .32, r_{pb}^2 = .01) \) nor was there a significant correlation between how long a student attended the college and visitation to the natural areas on campus \( (r = -.01, p = .92) \).

A one-way ANOVA revealed that academic major was significantly related to frequency of visits \( (F (6, 114) = 5.65, p < .001, \eta^2 = .24) \). Post hoc Least Significant Difference tests revealed that participants majoring in environmental studies, humanities, and art visited the natural areas on campus more frequently than those majoring in social sciences, natural sciences, and business \( (p \) ranged from \( p = .01 \) to \( p < .001 \)). Undecided majors fell in the middle and did not significantly differ from other types of majors. Descriptive data are provided in Table 1.

A new variable for academic major was created based on the ANOVA results by dividing major into two categories (social science, natural science, and business vs. humanities, arts, and environmental studies). This variable was entered into a hierarchical regression in order to test if it continued to relate to visitation after controlling for demographic variables. Gender, age, living on or off campus, and amount of time the student attended the college was entered in the first step \( (R^2 = .35, p < .001) \). Academic major was entered in the second step and had a significant incremental effect on visitation frequency \( (\Delta R^2 = .07, p = .001) \).

Students majoring in the social sciences, natural sciences, or business were less likely to have a course that required them to visit the lake or woods \( (\chi^2 = 7.66, p = .01, \phi^2 = .07) \). Forty six of these majors never took a course requiring a visit to the lake or woods whereas 20 had. On the other hand, only slightly more students majoring in environmental studies, humanities, or arts had taken a course requiring visitation \( (n = 24) \) than those who had not \( (n = 18) \).
Correlations Among Outdoor Experiences and Environmental Outcomes

Zero-order correlations were calculated for all participants to determine the relationship between outdoor experiences and environmentally responsible behaviors. Not surprisingly, preferences for outdoor experiences (assessed by asking participants how much free time they spent outdoors) was significantly correlated with frequency of visits to the natural areas on campus \( (r = .27, p = .006, n = 101) \). Environmentally responsible behaviors was not correlated with the amount of free time spent outdoors \( (r = .16, p = .104, n = 101) \), but had a moderately strong correlation with frequency of visits to the natural areas on campus \( (r = .46, p < .001, n = 115) \).

Correlations were also calculated excluding those who had never visited the natural areas on campus. These analyses help rule out that the previous correlations were due simply because of the potential impact of those who never visited the natural areas. A similar pattern of correlations emerged between amount of free time spent outdoors, frequency of visits to natural areas on campus, and environmentally responsible behaviors, although the correlations among those who have visited the natural areas at least once were slightly stronger (see Table 2). These correlations also permitted analyses of questions that were only asked of those who visited the natural areas at least once (e.g., place identification with the natural areas and having had a course requiring visitation). Having a course requiring visitation was correlated with environmentally responsible behaviors \( (r = .28, p = .008, n = 88) \) and place identity \( (r = .23, p = .03, n = 87) \). Place identity was correlated with environmentally responsible behaviors \( (r = .55, p < .001, n = 87) \). Amount of leisure time spent outdoors was not significantly related to course requirement or place identity (see Table 2).

Multiple Regression Analyses
Hierarchical regression analyses were conducted to determine if visiting more frequently or having a course that required visitation impacted place identity and environmentally responsible behaviors, while taking into account potential confounds (see Table 3). Gender, age, living on or off campus, amount of time at the college, and amount of leisure time spent outdoors was entered in the first step. Major was significant for both environmental outcomes, indicating that those who major in environmental studies, humanities, or arts had stronger place identity ($\beta = .53$, $p < .001$) and engaged in more environmentally responsible behaviors ($\beta = .50$, $p < .001$).

Frequency of visits to the lake or woods was entered in the second step. Results indicated that after taking into account demographics and amount of leisure time spent outdoors, frequency of visits still had a significant relationship with environmental outcomes. Specifically, the more one visited the lake or woods, the stronger one’s place identity ($\beta = .28$, $p = .024$, $\Delta R^2 = .05$) and the more frequent one’s engagement in environmental behaviors ($\beta = .45$, $p < .001$, $\Delta R^2 = .15$).

Visiting the lake or woods for a course requirement was entered in the third step to take into account potential confounding variables including frequency of visits. Having ever had a course requiring a visit to the lake or woods was significantly related to place identity ($\beta = .22$, $p = .046$, $\Delta R^2 = .04$). Additionally, visiting for a course requirement approached significance for environmentally responsible behaviors ($\beta = .19$, $p = .06$, $\Delta R^2 = .03$).

**Place Identity as a Potential Mediator**

Frequency of visits to natural areas on campus or having a course requiring visitation may impact environmental behaviors through place identity. In order to establish a mediational relationship, three criteria must be met. First, there must be a significant relationship between the predictor (experiences with natural areas) and the outcome (environmental behaviors). Second,
there must be significant relationships between the mediator (place identity or environmental paradigms) and both the predictor and the outcomes. The final criterion for mediation is that the relationship between the predictor and outcome must be reduced when the mediator is included in the equation (Baron & Kenny, 1986).

As shown in Table 3, when the frequency of visits to the lake and woods was regressed on environmental behaviors a significant relationship was revealed. Visiting for a course requirement was marginally significant. These results help demonstrate that the first criterion for mediation was met. A key part of the second criteria for mediation is that experiences with the lake and woods must have a significant relationship with the mediating variables. Again, previous regression analyses confirmed that frequency of visits and visiting for a course requirement was significantly related to place identity (see Table 3).

To examine if place identity mediated the relationship between frequency of visits or course requirement and environmental behaviors, another hierarchical regression was conducted. Environmental behaviors was the outcome variable, and the regression was identical to previous ones except that place identity was entered in the second step (see Table 4). Place identity was significantly related to environmentally responsible behaviors, which is a key part of the second criterion for mediation. In order to test the third criterion, the relationship between the predictors and outcomes must be reduced in this regression compared to the regression used to test the first criterion. The relationship between visitation and environmental behaviors was reduced slightly when place attachment was in the equation, but was still significant ($\beta = .45, p < .001$ vs. $\beta = .33, p = .005$). On the other hand, whereas the relationship between course requirement and environmental behaviors was marginally significant without taking into account place identity ($\beta = .19, p = .06$), this relationship was non significant when place identity was included in the
equation ($\beta = .10$, $p = .31$). Therefore there is evidence that place identity mediated the relationship between course requirement and environmentally responsible behaviors, but results do not support a mediating effect of identity for frequency of visits.

**Discussion**

The first aim of this research was to better understand who visits the natural areas on campus and for what reasons. The majority - over two-thirds of participants - visited the natural areas on campus at least once. Students who live on campus and are younger visited the natural areas more than those who live off campus and are older. These factors are correlated, and it is possible that proximity to the natural areas afforded to those on campus was the key factor affecting use as suggested by previous literature (Kaplan & Kaplan, 1995). Students who major in environmental studies, humanities, or art reported a higher frequency of visitation than those who majored in business, social science, or natural science. The finding that environmental studies majors were more likely to visit the natural areas than business majors is consistent with past research (Sherburn & Devlin, 2004). However, the results of the present study suggest that those in the social and natural sciences may be less likely to visit than those in the humanities and arts. Given that those who have undecided majors did not significantly differ from other majors in terms of frequency of visits, these results suggest that one’s academic major is related to a students’ interest in environmental experiences.

Students who visited the natural areas on campus did so primarily to engage in appreciative activities (enjoying nature or walking/hiking) that have been associated with environmental concern and involvement in environmentally responsible behaviors (Dunlap & Heffernan, 1975; Geisler et al., 1977; Teisl & O’Brien, 2003). Other reasons for visiting were to be with friends or for academic reasons such as studying or doing a course project. These are
more utilitarian uses of the natural areas, but are not necessarily consumptive (Dunlap & Heffernan, 1975) or abusive (Geisler et al., 1977). Based on the ways that students utilize the natural areas, we would expect a relationship with positive environmental outcomes. Indeed, in this study frequency of visits to natural areas was significantly correlated with both place identity and environmentally responsible behaviors. This relationship was significant above and beyond the impact of demographics, preferences for spending time outdoors, living on or off campus, and academic major. These results therefore support previous literature touting the importance of outdoor experiences (e.g., Chawla, 1999; Ewert et al., 2005; Moore & Graefe, 1994; Palmberg & Kuru, 2000) as well as research suggesting that experiences in adulthood can be meaningful and impactful (e.g., Loeffler, 2004). At the same time, it is important to note that these results do not provide evidence for a causal link between outdoor experiences and environmental outcomes. It is possible that students who already have an investment in environmental issues are more likely to visit the natural areas on campus.

Environmentally responsible behaviors are related to many different factors (e.g., Hines, Hungerford, & Tomera, 1987). The current research revealed that visitation to natural areas is one of those factors, but also suggested that academic major is important to consider. Academic major was significantly related to both place identity and environmentally responsible behaviors after taking into account gender, age, living on or off campus, and time at the college. Students likely gravitate toward a major based on previous events and interests, and once a major is declared the coursework required may help to reinforce or establish certain attitudes and behavior patterns. Consistent with this idea, students who majored in business, social science, or natural science were less likely to take a course that required visitation to the natural areas on campus. In fact, no participant reported taking a business course that required visitation. On the
other hand, several participants noted that a social science course required visitation and many indicated that a natural science course required visitation or that science activities were the focus of the visit. It is not clear, however, if these courses were integral to a major or simply elective courses designed for a students’ general education.

Examining the impact of having had a course requirement requiring visitation to the natural areas on campus was of particular interest. First, a variety of courses included a requirement for visiting the lake and/or woods on campus. This helps rule out that only environmentally-minded students will participate. In fact, only 10 students reported that they took an environmental studies course that required visitation. Second, although the types of activities required also varied quite a bit, most would be considered appreciative and are likely to be linked with positive environmental outcomes (Dunlap & Heffernan, 1975; Geisler et al., 1977; Teisl & O’Brien, 2003). Moreover, because the activities were integrated into an academic class it is likely that they included the instruction, feedback, and/or reflection. Such structure increases the likelihood that the outdoor experiences would impact environmentally responsible behaviors (Phipps, 1998) as well as place identity (Cuba and Hummon, 1993).

Results of this study support the hypotheses that having had a course requiring visitation was related to both environmentally responsible behaviors and place identity, and this was true even when factoring in demographics, major, preferences for spending time outdoors in general, and amount of time spent at the natural areas. Moreover, these results indicated that having a course requiring visitation impacted environmentally responsible behaviors through its relationship with place identity. Thus, it appears that a structured course activity in a natural area on campus can increase one’s identification with that area, and it is this identification that is linked with environmentally responsible behaviors.
These results suggest that if instructors require their students to visit the natural areas, environmentally responsible behaviors may increase. However, as with the results for frequency of visitation, a causal link cannot be tested given this data. Future studies utilizing experimental methods would be needed to help rule out alternative explanations. Still, this research provides evidence of the importance of outdoor experiences, especially those that take place in an academic context, in shaping one’s environmental perspectives and behaviors.
VISITING NATURAL AREAS ON CAMPUS

References


VISITING NATURAL AREAS ON CAMPUS


VISITING NATURAL AREAS ON CAMPUS


VISITING NATURAL AREAS ON CAMPUS

Table 1

*Frequency of Visits to Natural Areas on Campus by Academic Major*

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<th>Major</th>
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Table 2

*Correlations Among Outdoor Experiences and Environmental Outcomes for Visitors to Natural Areas on Campus*

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<td>.46***</td>
<td>.50***</td>
</tr>
<tr>
<td>3. Course required visit to natural areas on campus</td>
<td>--</td>
<td>.23*</td>
<td>.28**</td>
<td></td>
</tr>
<tr>
<td>4. Place identity with natural areas on campus</td>
<td>--</td>
<td>.55***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Environmentally responsible behaviors</td>
<td>--</td>
<td>--</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note. n ranged from 77 to 88 due to missing data except where noted.*

*p < .05, **p < .01, ***p < .001.*
Table 3
Hierarchical Regression Analyses for Outdoor Experiences and Environmental Outcomes Among Visitors to Natural Areas

<table>
<thead>
<tr>
<th></th>
<th>Place Identity</th>
<th>Environmentally Responsible Behaviors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>SE B</td>
</tr>
<tr>
<td>Step 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>1.08</td>
<td>0.88</td>
</tr>
<tr>
<td>Age</td>
<td>-0.09</td>
<td>0.08</td>
</tr>
<tr>
<td>Academic Major</td>
<td>3.72</td>
<td>0.75</td>
</tr>
<tr>
<td>Amount of Time at College</td>
<td>0.03</td>
<td>0.32</td>
</tr>
<tr>
<td>Live On or Off Campus</td>
<td>1.93</td>
<td>1.14</td>
</tr>
<tr>
<td>Amount of Leisure time outdoors</td>
<td>0.03</td>
<td>0.02</td>
</tr>
<tr>
<td>Step 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency of visits to lake or woods</td>
<td>0.55</td>
<td>0.24</td>
</tr>
<tr>
<td>Step 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Course required visit to lake or woods</td>
<td>1.52</td>
<td>0.74</td>
</tr>
<tr>
<td>Total R²</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p = .06, *p < .05, **p < .01, ***p < .001.
Table 4

Hierarchical Regression Testing Place Identity as a Mediator

<table>
<thead>
<tr>
<th>Step</th>
<th>B</th>
<th>SE B</th>
<th>β</th>
<th>ΔR²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1a</td>
<td></td>
<td></td>
<td></td>
<td>.35***</td>
</tr>
<tr>
<td>Step 2</td>
<td>.09**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Place Identity</td>
<td>0.64</td>
<td>0.20</td>
<td>0.38*</td>
<td></td>
</tr>
<tr>
<td>Step 3</td>
<td>.07**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency of Visits</td>
<td>1.12</td>
<td>0.38</td>
<td>0.33**</td>
<td></td>
</tr>
<tr>
<td>Step 4</td>
<td>.01</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Course Requirement</td>
<td>1.24</td>
<td>1.21</td>
<td>0.10</td>
<td></td>
</tr>
<tr>
<td>Total R²</td>
<td></td>
<td></td>
<td></td>
<td>.52***</td>
</tr>
</tbody>
</table>

Note. aGender, age, major, time at college, on/off campus, and amount of time spent outdoors was entered in the first step.

*p < .05, **p < .01, ***p < .001.