

# INFLUENCING BEHAVIOR CHANGE through Outdoor Programming and Environmental Education: A State of Knowledge Review

Victoria Derr, Environmental Studies Program, CSUMB

*Prepared for the Monterey County Outdoor Programming Network*

No. 1

-----

March 2017

ENVIRONMENTAL STUDIES PROGRAM

WORKING PAPER SERIES



California State University  
**MONTEREY BAY**

## ENVIRONMENTAL STUDIES WORKING PAPER SERIES



# INFLUENCING BEHAVIOR CHANGE through Outdoor Programming and Environmental Education: A State of Knowledge Review

---

Dr. Victoria Derr  
Assistant Professor  
Environmental Studies

Environmental Studies Program  
School of Natural Sciences  
100 Campus Center  
Seaside, California 93955

No. 1 | March 2017

[vderr@csumb.edu](mailto:vderr@csumb.edu)

# INFLUENCING BEHAVIOR CHANGE through Outdoor Programming and Environmental Education: A State of Knowledge Review

## The Attitude-Behavior Gap

The genesis for this report came from a series of meetings that led to the creation of the Outdoor Programming Network Steering Committee of Monterey County, California.<sup>i</sup> In these meetings, multiple local organizations expressed a desire to better understand and influence not only the knowledge, feelings, and beliefs of participants in their programs, but also to influence positive conservation behaviors, or pro-environmental behaviors. Research in the late 1980s and 1990s articulated the disconnect between environmental attitudes and intended behavior change. While many people may express care and concern for the environment, they do not necessarily carry these attitudes to their everyday actions and behaviors (Hines, Hungerford & Tomera 1986/1987 and Hungerford & Volk 1990). While this disconnect is commonly known, there still exists a vague understanding for how to most effectively influence conservation behaviors. Discussions among the steering committee pointed to this “fuzzy” understanding. Figure 1 reflects a common sense of the theoretical framework and relationship between environmental programming, attitudes and pro-environmental behaviors as it is applied in environmental education and conservation-focused programming. Essentially, many programs provide entry points to connect with nature, and through some programmatic focus, hope that their programming will influence long term behaviors. This fuzzy model feels, and is, insufficient for effective program design and assessment.

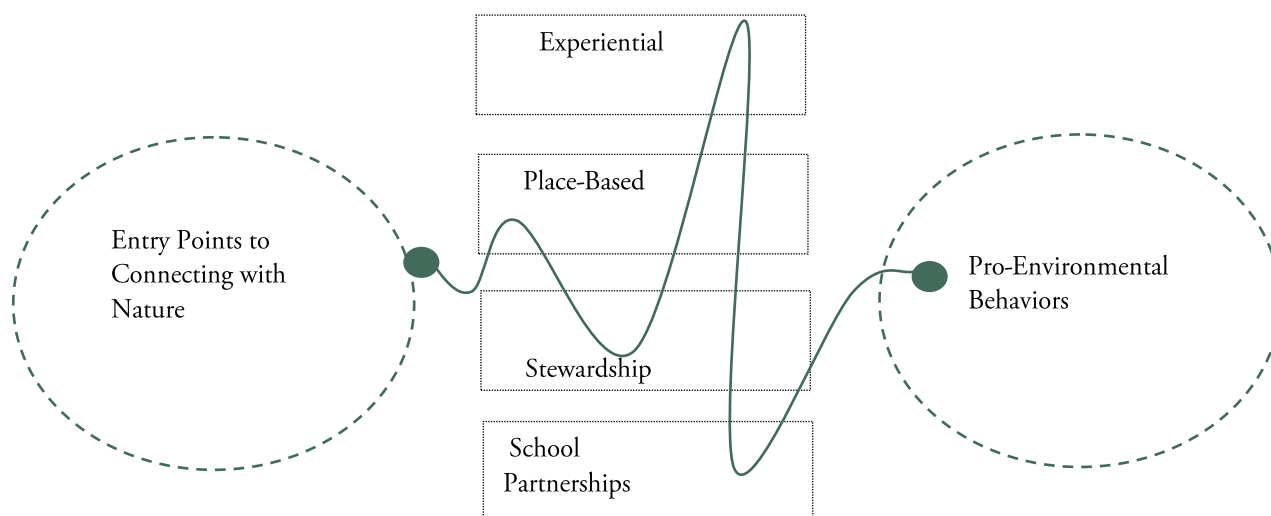


Figure 1. The “Fuzzy” Model of Educational Behavior Change: Program influences are held within a “black box” of uncertainty, with unclear or unascertained behaviors on the other end.

However, while conservation behaviors are much less understood and researched than environmental attitudes and knowledge, research from the past 30 years does point toward trends and patterns. This report summarizes these patterns, primarily drawing from a literature review conducted by Louise Chawla and Victoria Derr (the author of this report) that was published in 2012. Relevant research publications since 2012 also are integrated into research findings here.

This report provides an overview of basic theoretical frameworks for pro-environmental behavior change. It also summarizes the state of knowledge in four domains, or “buckets,” as the steering committee termed them. These

---

<sup>i</sup> These meetings were convened by the Big Sur Land Trust and MEarth, and involved participation from a wide number of regional organizations. The Steering Committee is comprised of representatives from Big Sur Land Trust, California State University Monterey Bay, MEarth, the Santa Lucia Conservancy, and the Ventana Wildlife Society.

include i) nature exploration; ii) nature centers and forest schools; iii) formal programs in the classroom and field; and iv) wilderness experiences. The report concludes with a summary of research findings across domains.

## Cultivating Conservation Behaviors: Theoretical Frameworks

Philosopher John Dewey (1938) was one of the first to promote learning by doing in an educational context. His thinking has been integrated into approaches to environmental education by Roger Hart (1997), who believed that children learn democracy by practicing it in their own communities, through exploration and action for local and meaningful issues. Many additional scholars have described a kind of “action competence” in which students learn environmental behaviors by learning about action and by participation in action (e.g., McLaren and Hammon 2005; Stapp, Wals and Stankorb 1996). Environmental psychologist, Louise Chawla (2009) developed a theory of pro-environmental behavior change that draws on three central factors: direct experience with nature, learning about nature and the environment, and development of a sense of efficacy, or ability to act (Table 1). In Chawla’s (2009) model, actions are mediated by opportunities and constraints on action as well as by an individual’s intention to act.

Table 1. Factors associated with action for the environment (compiled from Chawla 2009, Bandura 1997, Ojala 2012, Reed 1996)

Direct Experience	+	Learning	+	Sense of Efficacy
Positive experiences in nature		Primarily from secondary sources: Books, films, Instruction, Stories		Children learn they can have an impact on the world
Often associated with free play		Joint attention—children learn what is important based on		They develop positive experiences with taking action
Immersion, learning how to protect				Education provides “constructive hope” - trust in one’s ability to solve problems in a positive direction and trust in other social actors

Another framework for the development of environmental behaviors identifies varying emphases as individuals develop *across the lifespan* (Table 2). In this Model of Environmental Socialization (James, Bixler and Vadala 2010), early childhood is most influenced by direct experiences with nature, which are mediated by influential adults. In middle childhood (ages 7-12), acquisition of knowledge and skills and the development of hobbies become important. Youth (ages 13-18 or 24) then begin acquiring skills and developing a deepened sense of responsibility and activism. As individuals move through these stages, they develop a growing sense of identity. An important aspect of the Model of Environmental Socialization is that the experiences in earlier stages remain important and are carried through the lifespan. So direct experiences with nature, learning and doing, and socially-mediated experiences remain important to all stages for environmental socialization.

Table 2. Model of Environmental Socialization (James, Bixler, and Vadala 2010)

Early Childhood ———>	Middle Childhood ———>	Youth
Direct, socially mediated experiences	Environmental knowledge, skills, and hobbies	Preparing for environmental work and volunteering
[Nature exploration]	[Learning and Doing]	[Deepened responsibility, action, and activism]
-----Identity Formation----->		
<i>Direct experiences with nature and knowledge/skill building continue throughout the lifespan</i>		

## Cultivating Conservation Behaviors: Research Findings by Domain

The following summary of research is drawn primarily from Chawla and Derr (2012), and reports findings from studies that include retrospective approaches (with adults looking backward on significant experiences in childhood), longitudinal studies (following individuals over time), surveys and interviews, and direct observations. Limitations to research are described fully in Chawla and Derr (2012) but include the general dearth of studies that include behavior changes or sustained behavior, and that the majority of behavior studies rely on self-reports of behaviors, which can be un-reliable – people do not always remember or accurately report their behaviors even with the best of intentions. In general the domains reported here follow the lifespan model by James, Bixler and Vadala (2010), with experiences among younger ages reported in the first domains and older children and youth in the later domains.

### Domain 1: Nature Exploration

Most research in this domain is retrospective – asking adults to reflect back on their experiences or asking young people involved with nature or environmental clubs to reflect on how they became interested and involved. Importantly, studies with youth show contact with nature in childhood *as well as* social supports – adults, leaders of camps or environmental programs, teachers – who showed approval for their interest. These studies exemplify the combined influences of *fields of free- and promoted-action*. Children's geographic research with children in middle childhood also identifies similar trends: children's direct explorations with nature play a central role in the development of connection to nature, and adult promoted actions can demonstrate care for nature that influences children's own behaviors (e.g., Derr 2006).

*Direct, positive experiences in nature, with opportunities for free play and socially-mediated actions are important in early childhood*

In summary, **Nature Exploration** is:

- Important in providing motivation for pro-environmental behaviors.
- Influenced by the social context – experiences that promote fields of *free* and *promoted* action. *Fields of free* action are child-driven activities in which children explore nature and learn their own capacities for action. *Fields of promoted action* involve adults – generally positive outings in nature, gifts that promote nature learning or exploration, permission to play in nature during school recess. These contexts combine independent and social learning (Reed 1996a, b).
- Influenced by negative environmental experiences (nettles, mosquitoes, spiders, snakes), which can weaken the intention to act. This negative impact is less strong than the beneficial impacts of positive experiences. In other words, positive experiences are stronger in influencing intention to act than are negative influences at detracting from this (Bögeholz 2006).

## Domain 2: Nature Centers

Studies of nature centers and nature-based programming have primarily been conducted with a longitudinal model, in which pre- post, and a delayed-post (3-6 months post experience) test are issued. This research finds that extended field experiences with **nature centers** can lead to pro-environment behavior changes. For example:

- Asch and Shore (1975) found that students who went through a two year classroom and nature-center curriculum demonstrated more stewardship behaviors than a control group.
- An assessment of 4<sup>th</sup>-8<sup>th</sup> grade students in 3- and 5-day residential nature center programs that focused on biodiversity in Great Smokey Mountain National Park measured nature connection, attitudes, knowledge, and stewardship behaviors (Stern, Powell and Ardoin 2008). This assessment showed significant gains in all measures after the program. Attitudinal and stewardship measures were retained, but diminished, after 3 months' time. Those who participated in the 5-day program differed from than those in the 3-day program only in having stronger *knowledge*. When a similar study was conducted in the Chesapeake Bay, behaviors were retained more strongly after the 2<sup>nd</sup> year of the program, when the curriculum was more closely tied to actions students could take at home (Stern, Powell and Ardoin 2011).

Factors that influence retention include i) previous experiences in nature, ii) longer duration experiences (5 days or more), iii) repeated experiences (multiple experiences over time), and iv) direct linkages between program activities and students home lives – so that actions are transferable to home.

*Duration, immersion, and an emphasis on transferability of skills to home environments all impact retention of pro-environmental behaviors*

## Domain 3: Formal Programs that Occur in the Classroom and Field

Retrospective studies suggest that the level of influence of formal programs is small compared to free choice learning outside of school, with an average of about 20% of environmentally active youth or adults identifying these programs as a significant influence in their formative experiences. In reviews of formal programs, between 1971 to present, only about 10% of all studies conducted included behavior measures. Thus our knowledge is limited by lack of research.

Research in this domain is also limited because many assessments include curricula not fully implemented by the teachers, thus rendering the results invalid. Other limitations include i) the need for mixed methods research (both qualitative and quantitative); ii) the need for research and assessment that meet program goals, so that the two are more closely tied and relevant; iii) the need for more consistent application of evaluation instruments across programs; iv) the need to assess student learning not as passive vessels but as active agents of learning and change; and iv) the need to consider other factors, such as social class, that may be more important than any curricular intervention.

Despite limitations, reviews of research have identified the following as important elements for **School Programs that Include Classroom and Field Education**:

- Successful programs include experiential education, including field trips, service projects, and/or investigation of local issues
- In-class preparations and before and after follow ups to field trips are more effective at promoting change
- Programs of long duration (from a weekend to two years) are more effective than short duration
- Students are more likely to change behaviors when *actively* constructing knowledge rather than serving as passive recipients, e.g., when students have some degree of choice in topics they will investigate and determine actions for. Hungerford and Volk's model (1990) suggests that students more likely to take action if they take ownership, gather information, know action strategies, and feel confident in taking actions. This suggests that students need not only learn about the issue, but also about *how* to take action (e.g., Zint, Kraemer, and Kolenic 2014).
- School-community partnerships are effective because they allow students to participate in authentic (real world) issues, to participate in forming action plans, and to take meaningful actions. These are significant in fostering behavior change, at least in the short term (longer term has not been assessed).

Service learning is similarly effective because it provides students with the opportunity to become catalysts for change in their own communities.

*The ability to participate in real issues, to participate in forming action plans, and to take action are significant influences for students*

## Domain 4: Wilderness and Experiential Programs

Wilderness experience programs, with immersion for generally 5-10 days, have demonstrated significant impacts on individuals, particularly in psychological domains such as self-concept. However, less well assessed are these programs' effects on environmental attitudes, knowledge, or pro-environmental behaviors. Research about wilderness program impacts has included longitudinal studies (pre- post- and delayed-post surveys and interviews), as well as retrospective studies. Among the research on the factors influencing **Wilderness Experience Programs**, evidence suggests that:

- Only programs with an educational focus influence educational outcomes (Frieze 1996). In other words, only programs that directly seek to teach environmental knowledge, skills, or pro-environmental behaviors have these effects.
- Wilderness immersive programs can have a significant effect – sometimes one of the most significant in a lifetime (Daniel 2003, Kellert and Derr 1998).
- Programs that seek to influence attitudes and behaviors do have an impact. The impact tends to be much greater on attitudes or knowledge than on behaviors. Some programs result in heightened environmental concern and awareness, but not increased behaviors (Haluza-Delay 2001, Kellert and Derr 1998).
- Young people who participate in more than one such program show stronger effects across domains.
- Those programs which directly teach skills and focus on *stewardship* of the environment (and not just experience) as well as the *transferability* of concepts and skills to home environments have greater sustained behavior changes (Kellert and Derr 1998, Mazze 2006).



- As with nature exploration research, urban youth can sometimes experience nature negatively. This is viewed as a challenge to overcome as urban youth learn to become comfortable with different environments. However, these same youth also express respect for nature and see nature as an important refuge. Duration and immersion were important factors in overcoming negative associations with nature, such as dirt (Lekies, Yost and Rode 2015).

*Programs that directly teach skills and focus on transferability have greater impacts on environmental behaviors*

## Summary of Research Findings

Childhood play in nature has been linked to informed citizen action, volunteerism, public support for pro-environmental policies, environmental career choices, and environmentally-conscious consumption and behaviors (such as purchasing green products, conserving energy, and recycling). These early experiences in nature have two central domains – *fields of free action*, where children independently determine their play and learn from their own actions, and *fields of promoted action*, in which adults help shape and guide experiences to give attention and value to nature as a part of their experiences.

As children develop, the influence of schools, nature, and outdoor programs, as well as personal and social variables, all can have a significant impact on attitudes, knowledge, and behaviors. Results from meta-analyses of environment-behavior research suggest that *the intention to engage* in pro-environmental behaviors can mediate other social and personal influences. In other words, those who believe they can act, and explicitly intend to do so, are more likely to do so (Gifford and Nilsson 2014).

Well-designed programs can have positive influences on pro-environmental behaviors. However, we still lack much evidence for long-term effects and retention of such behaviors, and there is no magical length of time or recipe for experiences that will guarantee desired behavioral outcomes. **Central factors that influence pro-environmental behavior include:**

- ***Extended duration field experiences.*** This includes programs that integrate curriculum between school and field over a year, or multiple years; or provide complete immersion for 2-5 days or more.
- ***Learning connected to home environments.*** Behaviors are sustained when the education program directly connects stewardship behaviors in the field with actions that can be taken at home, and when learning is connected to local environmental contexts.
- ***Social support for environmental care.*** Parents and other family members, teachers, friends, and mentors all can play a significant role in guiding environmentally responsible action. Bixler, James and Vadala (2010) and McLaren and Hammond (2005) provide detailed discussions for how to achieve this within environmental programming.
- ***Students actively involved in learning.*** Student investigations of local environmental issues, training in action skills as part of the curriculum, and student involvement in developing and implementing action plans are important components of environmental programming that promote behavior changes. In this context, knowledge is used to guide action rather than being a means unto itself. At least 8 studies have demonstrated that students need opportunities *to learn and practice action skills* for effective behavior change.



- **Meaningful action can address social as well as environmental issues.** This is particularly important and effective in places with high poverty rates or social exclusion from nature, and is probably the least developed area of research and evaluation (Warren et al. 2014).

Opportunities for future research include the use of common measurement across program types, mixed methods (both quantitative and qualitative) research, and longitudinal research. A particular gap remains the understanding of ways that individuals mediate their environmental experiences through their own personal and social backgrounds and experiences, especially in contexts where children have less access to nature or environmental education.

## Literature Cited

- Asch, J. & Shore, B. M. (1975). Conservation behavior as the outcome of environmental education. *Journal of Environmental Education*, 6(8), 69-33.
- Bandura, A. (1997). *Self-efficacy*. New York: W. H. Freeman.
- Bögeholz, S. (2006). Nature experience and its importance for environmental knowledge, values and action. *Environmental Education Research*, 12(1), 65-84.
- Chawla, L. (2009). Growing up green. *Journal of Developmental Processes*, 0(1), 6-23.
- Chawla, L., & Derr, V. (2012). The development of conservation behaviors in childhood and youth. S. Clayton (ed.), *Handbook of conservation psychology* (pp. 96<sup>1</sup>-555). Oxford University Press.
- Daniel, B. (2003). *The life significance of a spiritually oriented, Outward Bound-type wilderness expedition*. Unpublished doctoral dissertation, Antioch New England Graduate School, Keene, NH.
- Derr, V. (2006). *Sometimes birds sound like fish: Perspectives on children's place experiences*, in C. Spencer and M. Blades (Eds.), *Children and Their Environments: Learning, Using and Designing Spaces*. Cambridge University Press.
- Dewey, J. (1938) *Experience and education*. New York: Touchstone Press.
- Friese, G. T. (1996). *An inventory and classification of wilderness experiences programs*. Unpublished master's thesis, University of Idaho.
- Gifford, R., & A. Nilsson. (2014). Personal and social factors that influence pro-environmental concern and behavior: A review. *International Journal of Psychology*, DOI: 10.1002/ijop.12034
- Haluza-Delay, R. (2001). Nothing here to care about: Participant constructions of nature following a 12-Day wilderness program. *The Journal of Environmental Education*, 32(8), 87-48.
- Hart, R. (1997). *Children's participation*. London: Earthscan Publications.
- Hines, J.M., Hungerford, H.R., & Tomera, A. (1986/1987). Analysis and synthesis of research on environmental behavior: A meta analysis. *Journal of Environmental Education* 74(2), 1-8.
- Hungerford, H., & Volk, T. (1990). Changing learner behavior through environmental education. *Journal of Environmental Education*, 21(3), 8-21.
- James, J. J., Bixler, R. D., & Vadala, C. E. (2010). From play in nature, to recreation then vocation. *Children, Youth and Environments*, 20(5), 675-256. Retrieved March 3, 2011 from <http://www.colorado.edu/journals/cye>.
- Kellert, S. R. & Derr, V. (1998). *A national study of outdoor wilderness experience*. New Haven, CT: Yale University, School of Forestry and Environmental Studies.
- Lekies, K.S., Yost, G., & Rode, J. (2015). Urban youth's experiences of nature: Implications for outdoor adventure recreation. *Journal of Outdoor Recreation and Tourism*, 5, 1-10.
- Mazze, S. (2006). *Beyond wilderness: Outdoor education and the transfer of environmental ethics*. Unpublished master's thesis, University of Oregon. Retrieved September 21, 2010, from <http://scholarsbank.uoregon.edu/jspui/handle/1794/3581>.

- McLaren, M., & Hammond, W. (2005). Integrating education and action in environmental education. In E. A. Johnson & M. J. Mappin (Eds.), *Environmental education and advocacy* (pp. 267-291). Cambridge: Cambridge University Press.
- Ojala, M. (2012). Hope and climate change: the importance of hope for environmental engagement among young people. *Environmental Education Research*, 74(5), 625-642.
- Reed, E. S. (1996a). *Encountering the world*. New York: Oxford University Press.
- Reed, E. S. (1996b). *The necessity of experience*. New Haven: Yale University Press.
- Stapp, W. B., Wals, A. E. J., & Stankorb, S. L. (1996). *Environmental education for empowerment*. Dubuque: IA: Kendall/Hunt Publishing.
- Stern, M., Powell, R. & Ardoin, N. (2008). What difference does it make? Assessing outcomes from participation in a residential environmental education program. *Journal of Environmental Education*, 39(8), 75-43.
- Stern, M., Powell, R. & Ardoin, N. (2011). Evaluating a constructivist and culturally responsive approach to environmental education for diverse audiences. *Journal of Environmental Education*, 42(2), 109-122.
- Warren, K., Roberts, N.S., Breunig, M., & Alvarez, A.G. (2014). Social justice in outdoor experiential education: A state of knowledge review. *Journal of Experiential Education*, 93(1), 89-103.
- Zint, M., Kraemer, A., & Kolenic, G. (2014). Evaluating *Meaningful Watershed Experiences*: An exploration into the effects on participating students' environmental stewardship characteristics and the relationships between these predictors of environmentally responsible behavior. *Studies in Educational Evaluation*, 07, 4-17.

## ENVIRONMENTAL STUDIES PROGRAM

### WORKING PAPER SERIES

- No. 1 INFLUENCING BEHAVIOR CHANGE through Outdoor Programming and Environmental Education: A State of Knowledge Review, 2017
- No. 2 A CONTINUUM OF PLACE: the Fort Ord Public History Project, 2017
- No. 3 HEALTH EFFECTS OF PESTICIDES: State of Knowledge Review, 2017
- No. 4 BIOPHILIC DESIGN AT CSUMB: Report of Findings from a Campus Photovoice Assessment, Stakeholder Interviews, and Focus Group, 2017



California State University  
**MONTEREY BAY**

No. 1

-----

March 2017

### ENVIRONMENTAL STUDIES PROGRAM WORKING PAPER SERIES

The mission of the Environmental Studies Program at California State University Monterey Bay is to develop students and communities with the knowledge, skills, and compassion to promote social and environmental justice and sustainable communities.