

Can Education Change Behavior?

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What do we mean by education?

- ▶ **Education is purposeful, designed intervention**
- ▶ **Formal Education**
 - ▶ K-12 school-aged youth in school
 - ▶ Teacher professional development
 - ▶ Instructional materials development
 - ▶ College and university learners, courses, curriculum
- ▶ **Non-formal Education**
 - ▶ Youth out of school, in clubs, summer camps
 - ▶ Free choice learning in museums, zoos, nature centers
 - ▶ Adult educational programs
 - ▶ Institutions that offer educational programs
- ▶ **Communication** = purposeful campaign or materials

Programs with standardized goals and graduation requirements

Programs for interested learners, offered by institutions, agencies and organizations

What is behavior?

- ▶ In education = learning
 - ▶ Able to explain, list, draw, demonstrate
- ▶ In environmental education = preparing learners with knowledge and skills
 - ▶ Enabling people to understand issues, to be motivated to act, to have the skills and abilities to solve or prevent problems
- ▶ In environmental realm = environmentally responsible behavior
 - ▶ Personal habit, conscious effort to reduce impact on planet



What changes behavior?

- Information
 - Knowing why
 - Knowing consequences of action & inaction
 - Knowing how
- Models, demonstrations, examples, visioning
- Norms, support
- Incentives, contests, awards, disincentives
- Commitment
- Removing barriers, making it easier



M. Fishbein and I. Ajzen, **Theory of Planned Behavior**
E. Rogers, **Diffusion of Innovation**
D. McKenzie-Mohr, **Community-based Social Marketing**

Can schools promote environmentally responsible behavior?



- If they don't, who will?
- If they do, only for socially accepted issues?
- If for a controversy, who decides?
- What if the teacher's and parents' perspectives conflict?

Water Education Programs in Schools



- ▶ Project WET activities
 - ▶ Water cycle, quality, quantity, watershed, aquatic ecosystem, wetlands
- ▶ How much water do you use? Household measurements
- ▶ Practice water conservation strategies
- ▶ Understand nonpoint source pollution problems

Information does not automatically change behavior, but educators can nurture appropriate behaviors.

Global Rivers Environmental Education Network (GREEN)

- Students collect water quality data on a river and enter it into a shared database
- Across a watershed
- Students use data to discuss findings, problems, causes
- Students meet at watershed conference to consider actions



With good leadership, students can



- ▶ Collect quality data for local agencies or citizen science
 - ▶ Mantova, Italy chemistry class provides background data
- ▶ Submit recommendations for reducing nonpoint pollution
 - ▶ Sixth grade class in Utah offers household hazardous waste regulation
- ▶ Coordinate community education on an issue
 - ▶ Poster contests, distribute faucet restrictors
- ▶ These can be important empowering and skill building activities.
 - ▶ Are youth being used by agencies as free labor or to obtain media attention? Partnerships between educators, agencies, and community leaders can make these programs successful for everyone.

Water Education in NonFormal Arenas

- ▶ Nature centers, museums
 - ▶ Exhibits, programs, community groups
- ▶ Brevard Zoo
 - ▶ 4th grade program at Indian River Lagoon
 - ▶ pseudo-Indian River Lagoon exhibit
 - ▶ monthly mystery program





Evaluation of Lagoon Quest

- ▶ Fourth grade participants significantly improve knowledge of estuarine ecology; Title 1 schools improved more than non-Title 1.
- ▶ Program is interesting, enjoyable; students wish to return to Indian River Lagoon.
- ▶ Teachers want the field trip to be held after FCAT tests, but logistically hard
- ▶ Connection from ecology to behavior could be strengthened
- ▶ In-service training may help teachers complete the unit and emphasize important concepts back at the classroom
- ▶ Families were not engaged as expected; kids did not take materials home
 - ▶ Cheng, J. C-H and Monroe, M. C. 2008. Measuring the effectiveness of Lagoon Quest. EDIS Cir 1528, Gainesville: Univ of Florida.



Research Involving Lagoon Quest

- ▶ Field trip formerly offered as an optional program; in 2005 it became a required component of 4th grade curriculum. How do previous experiences and training affect teacher attitudes about the program?
 - ▶ Teacher survey, 91 completed of 130 returned, which was 50% response of population
 - ▶ Focus groups with schools where few teachers responded
 - ▶ Student pre/post quiz for learning and attitude
- ▶ No difference in teacher enthusiasm & interest in LQ based on previous experience; everyone had positive attitudes.
- ▶ In focus groups, those who taught science expressed more positive impressions of student interest & learning. Those with less experience teaching science wished for more assistance and were less comfortable with content.

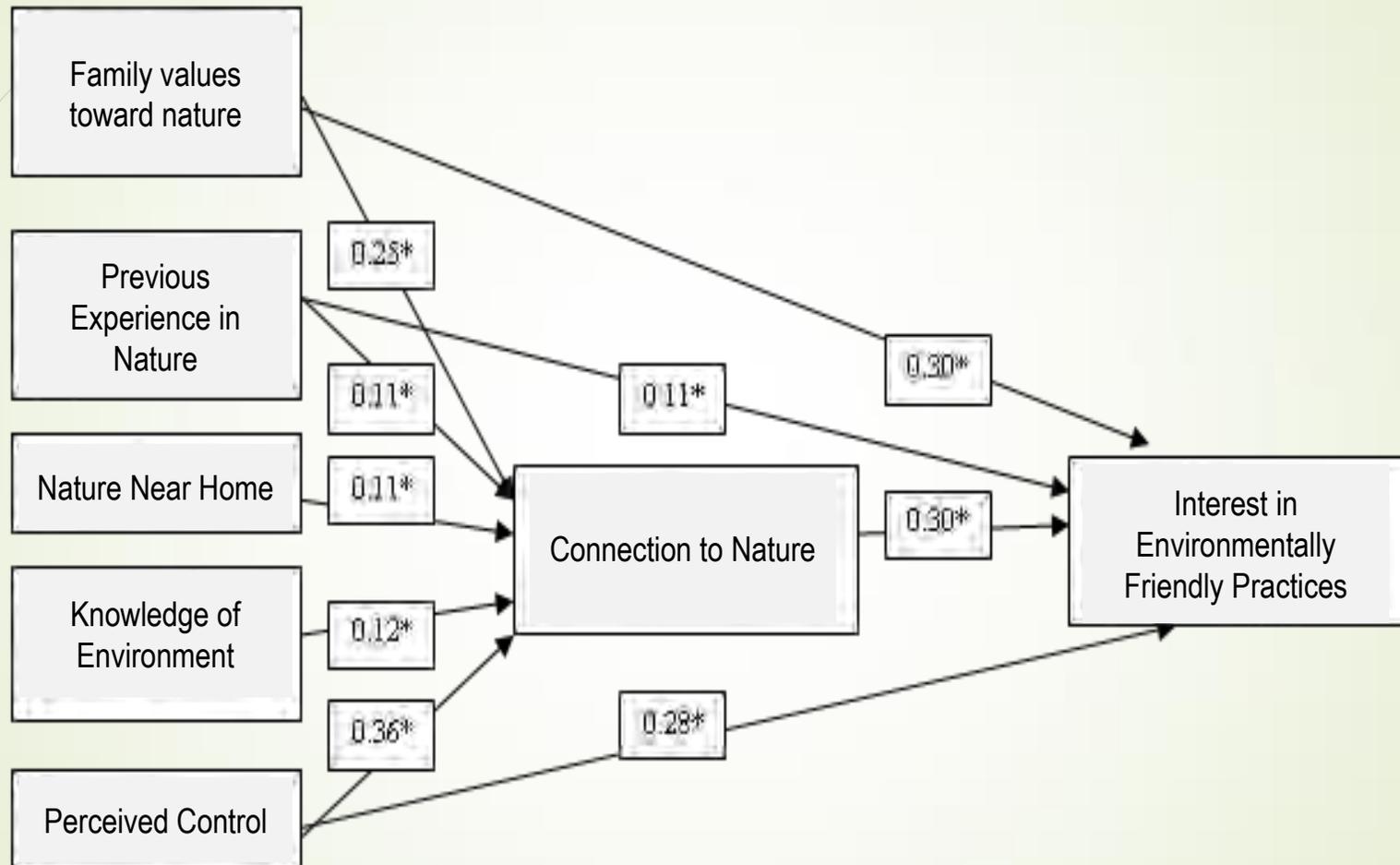
Cheng, J. C-H. and M.C. Monroe. 2010. Teachers' Attitudes Toward an Environmental Education Program. *Applied Environmental Education and Communication*. 9(1): 28-37.



And More

- ▶ Can we measure “connection to nature”? What correlates with it? What does it predict? Could this be a baseline for measuring change as the result of a comprehensive EE program?
 - ▶ Interviews with students to understand their experience with nature; pilot test to check for reliability; 6 items dropped (Cronbach’s alpha of 0.87)
 - ▶ 1432 respondents
 - ▶ 4 factor model: enjoyment of nature, empathy for creatures, sense of oneness, and sense of responsibility
- ▶ Perceived family values toward nature, previous experience, knowledge, nature nearby home all correlate to connection to nature index

Cheng, J. C-H. and M. C. Monroe. 2012. Connection to nature: Children’s affective attitude toward nature. *Environment and Behavior*. 44(1): 31-49.



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What about Adult NF Education?

- ▶ Preparing people to help resolve natural resource problems
- ▶ Data collection
 - ▶ RiverKeepers, LakeWatch
 - ▶ Monitoring quality and point sources, community programs, advocacy
- ▶ Collaborative Adaptive Management teams
 - ▶ Need skills: listening, communicating, negotiating, facilitating, systems thinking
- ▶ **Springs-basin Working Groups**
 - ▶ Awards, media, posters, meetings to share scientific findings, draft recommendations
 - ▶ Persuasive campaigns to conserve water, reduce fertilizer, etc.



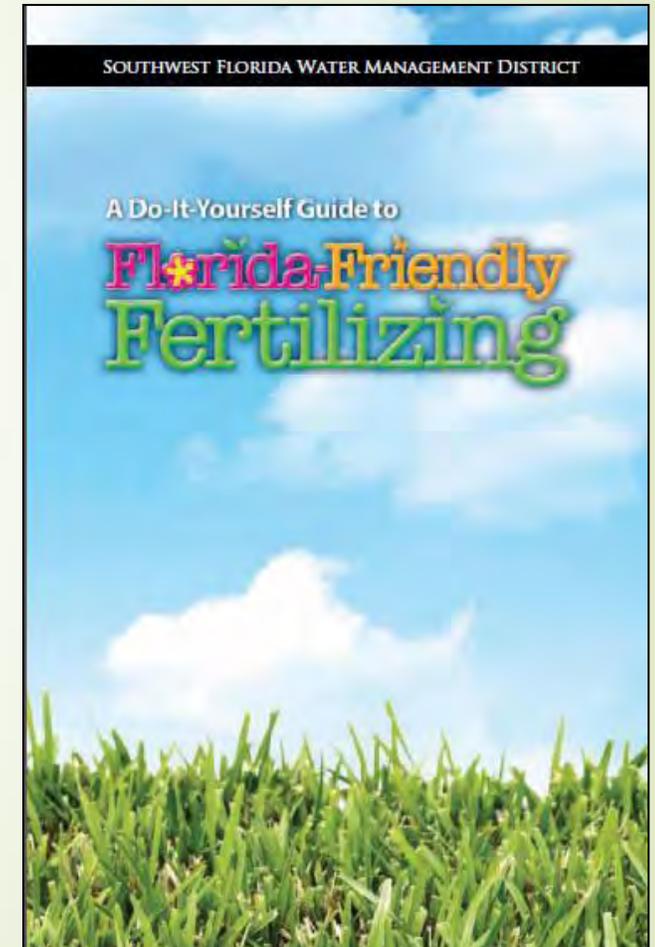
Springs-basin Working Groups

Working groups created:

- 1) Informed citizens who believe they are effective advocates for springs health
- 2) Opportunities to interact with scientists
- 3) Opportunities to work with media and planners
- 4) Social capital
- 5) Social norm
- 6) Public trust



Communication campaigns



“No crab should die suffocating in oxygen depleted water. It should be steamed and eaten with Old Bay and melted butter.”

In the Chesapeake Bay and South Florida

Types of educational behavior change programs

	Formal	Nonformal	Communication
Preparing learners	<ul style="list-style-type: none">• Traditional EE uses activity guides, units• Often in science• Varies in quality• Community projects	<ul style="list-style-type: none">• Providing information• Creating platform for CBNRM or CAM	<ul style="list-style-type: none">• Providing information
Env Resp Behavior Change	<ul style="list-style-type: none">• Not common; avoiding greenwashing, nagging	<ul style="list-style-type: none">• Social marketing	<ul style="list-style-type: none">• Social marketing

Common educational programs

	Formal	Nonformal	Communication
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Effective educational programs for achieving change

	Formal	Nonformal	Communication
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Interesting researchable questions

- ▶ What increases effectiveness at individual and community level
- ▶ Which behaviors account for increased environmental quality; which are “starter” behaviors that kick start others; what is worth doing and why
- ▶ What strengthens resolve, such that communities will agree to additional costs or inconvenience to improve environmental quality
- ▶ How can misconceptions be effectively addressed
- ▶ Individual vs community education: Is social capital and outcome or ingredient
- ▶ Communicating complexity; what can the interested public handle; when do they willingly abdicate to experts
- ▶ Role of knowledge, experience, and sense of place in establishing commitment to environmental quality



Questions and Comments?

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