Conservation Biology

Special Section Essay

Conservation Means Behavior

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Most instances of deteriorating environmental conditions are caused by human behavior. Although there are certainly instances of such environmental conditions developing from natural processes, most are largely the result of human activity. Drivers of phenomena such as climate change, loss of species' habitats, and ocean acidification rarely are the result of malicious intent, but rather the consequence of the lifestyles of billions of humans. Accordingly, efforts to promote conservation must change behavior (Ehrlich & Kennedy 2005; Schultz & Kaiser 2012).

This fundamental link between conservation and behavior has been noted in a number of recent publications. Mascia et al. (2003) state that "Biodiversity conservation is a human endeavor: initiated by humans, designed by humans, and intended to modify human behavior. . .." Cowling (2005) calls this realization "an epiphany for. . .natural scientists." And Balmford and Cowling (2006) note that "conservation is primarily not about biology but about people and the choices they make." Here I would go one step further and propose that conservation is a goal that can *only* be achieved by changing behavior.

Progress in Conservation Biology

In celebrating the 25th anniversary of *Conservation Biology*, it is instructive to look back and assess the progress of efforts to promote conservation. Conservation biology as a discipline has had considerable success in identifying the biological processes that are being affected by human behavior. In this sense, the discipline is largely problem oriented and has focused primarily on cataloging threats to the status of biological diversity, rather than on responding to these threats. Although there are good reasons for this imbalance, a casual review of the literature shows a heavy emphasis on science and substantially less emphasis on practice.

On the progress side, the work of conservation biologists has provided a solid scientific foundation for policy and for activist groups aiming to raise awareness among the general public about the need for conservation. Surveys of the general public around the world show a generally high level of concern about environmental issues and support for environmental protection (Leiserowitz et al. 2005). Yet despite these high levels of awareness, there have not been dramatic changes in personal actions or widespread patterns of behavior (Moore 2002; Crompton 2008). Consequently, individuals in industrialized nations around the world continue to consume high levels of resources and to live in unsustainable ways.

In this essay, I highlight four research findings that illustrate the challenges of changing behavior:

(1) education does not typically result in increases in conservation behavior;
(2) human thinking is biased and promotes short-sighted responses to environmental threats;
(3) individuals generally perceive themselves as separate from nature; and
(4) social norms guide behavior.

First, results of psychological studies have shown consistently that increasing knowledge through education, whether related to health, safety, or conservation, does not lead to a change in behavior (McKenzie-Mohr et al. 2012). Instead, behavioral and social scientists argue that motivation is the driving force behind behavior change. Although there are instances in which individuals are motivated but lack sufficient (or accurate) information about what behavior to change or how to change, generally information or education alone will not induce a change in behavior (Schultz 2002*a*; Fisher et al. 2009).

Second, human cognition is not always rational, and an individual's beliefs and judgments are subject to a host of cognitive and perceptual biases. Results of recent studies show both spatial and temporal influences on individual-level judgments about the severity of environmental problems. Drawing on data from 18 countries, Gifford et al. (2008) found a strong tendency for individuals to report that environmental problems were more severe globally than locally—things are better here than there. Additionally, environmental problems are seen as likely to become worse in the future–things are better now than they will be later. Such beliefs lead the general public to rank loss of biodiversity as a lower priority than more salient threats such as poor economic conditions, terrorism, or even traffic congestion. Indeed, individuals

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feel a stronger sense of personal responsibility and a stronger motivation to respond to contemporary issues at the local level, and environmental problems are generally seen as less pressing (Uzzell 2000).

Third, there is a general tendency for individuals to see themselves as separate from nature (Schultz 2002*b*). This belief manifests itself across many policies, programs, and actions by individuals, communities, and countries. Researchers have found that individuals who perceive a higher degree of connectedness between themselves and nature are more likely to engage in a range of conservation behaviors (Schultz 2001; Mayer & Frantz 2004; Gosling & Williams 2010). Efforts to promote beliefs about connectedness through experiential activities, citizen science, and environmental education could potentially increase the probability of such conservation behaviors.

Finally, humans tend to look to the behavior of others as a guide for interpreting events and for choosing a course of action. As a consequence, we are generally reluctant to deviate from the norm. In many situations, the prevailing norm does not favor conservation, and there is a tendency to believe that other people are engaging in conservation behaviors at a lower rate than oneself. Along these lines, messages that lament the frequency or ubiquity of undesirable behaviors serve to make conservation tantamount to deviance and ultimately reinforce the prevailing norm (Cialdini 2003).

However, providing cues about the widespread support for environmental protection and conservation can change behaviors (Schultz 2010). For example, Cialdini et al. (2006) showed that highlighting the fact that many visitors to a national park had taken protected items out of the park actually increased the rate of theft, whereas a posted message highlighting social disapproval of such behavior reduced theft rates. Similarly, research by Keizer et al. (2008) showed that posting a sign discouraging a behavior can have the opposite effect when there are contextual cues that most people do not obey the sign. For example, consider the case of a posted sign encouraging visitors at a national park to stay on the maintained trail to protect the sensitive root systems of local trees. If such a sign is posted in an area where there is clear evidence that other park visitors have not complied with the rule (e.g., pathways through the forest), the posted sign is likely to increase the number of visitors who stray from the trail (cf. Keizer & Schultz 2011).

Increasing the Success of Conservation in the Next 25 Years

The mission of the Society for Conservation Biology is to advance the science *and* practice of conserving Earth's biological diversity. But as noted above, conservation biology has been more effective in advancing science than the practice of conservation. However, in moving forward there is room for optimism, and there are several avenues through which the practice of conservation can be advanced.

Use of Motivational Messages

Efforts to educate the public and raise awareness must include a motivational element—that is, a reason for action. Social and behavioral scientists have identified a number of potential motivations, including self-interest, social responsibility, and self-transcendent values (Stern 2000). And other domains of research, including health and medicine, provide consistent evidence that information coupled with motivation can induce change (Fisher et al. 2009).

A note of caution is warranted here about using mass media to promote conservation. It seems clear that the media can be a powerful ally in efforts to change behavior, and there are many notable examples of conservation programs that have successfully used community-based social-marketing strategies to change behavior (McKenzie-Mohr et al. 2012). However, most marketing activities are designed to attract and retain an audience with the goal of selling a product. Achieving conservation objectives, by contrast, often involves a level of cost or sacrifice to the individual, such as reducing consumption or abstaining from a previous behavior. Indeed, consumerism is often cited as one of the chief causes of many environmental problems, and it seems unlikely that conservation and sustainability can be achieved by buying certain products.

Results of research by behavioral scientists suggest that messages that focus on single, achievable, and specific actions are more likely to succeed. Broad pleas to "protect the environment" or "save the planet" are generally ineffective at changing specific behaviors (Costanzo et al. 1986). In addition, presenting people with long lists of behaviors to adopt is likely to be overwhelming and unlikely to be effective with any except the most ardent supporters. Furthermore, there is evidence to suggest that promoting positive behavior alternatives is more likely to induce change than attempts to curtail or prevent a certain behavior.

Behavioral Prioritization

Conservation biologists often talk about place prioritization, the process of identifying areas for conservation on the basis of a given set of objective, quantitative criteria (Sarkar et al. 2002). Although the algorithms and methods for prioritization have been debated, there is general agreement that prioritizing some places over others is useful. The same basic principle could be applied to behavior prioritization by targeting high-priority behaviors for change.

Although there are a number of considerations in selecting behaviors to target with conservation programs, one effective approach is described in the community-based social marketing literature (McKenzie-Mohr 2011). The first consideration in this approach is the connection between a behavior and a desired outcome. Take as an example contaminants in surface waters near an urban area. Many different types of contaminants are present, and some are more harmful than others. Plant matter such as leaves and grass can reduce dissolved oxygen levels in the water, harming fish and other species. But there are other contaminants of concern, including bacteria from inadequate sewage treatment, chemicals such as grease and oil, and nitrates and phosphates from fertilizers. Each of these contaminants is linked with many different behaviors and many different sources, each affecting water quality to a different degree. In moving from science to practice, it is necessary to prioritize the high-impact biological target and the high-impact behavior.

The second consideration in behavior selection is plasticity, the probability that a behavior can be changed. The plasticity of a behavior is typically expressed as a proportion of the population that could potentially be convinced to adopt the target behavior (Dietz et al. 2009). Plasticity involves two elements: the proportion of a target population that is already engaging in the behavior, and the effectiveness of social marketing programs in changing the behavior. Behavioral adoption in the target population can be measured through observations or surveys, and conservation efforts are typically best targeted at behaviors in which a small proportion of the population is engaged. Yet even for such behaviors, there are different probabilities of change that reflect structural obstacles such as convenience, local customs or culture, or personal values. The plasticity of a behavior can be identified through pilot testing of program elements or through reviews of previous programs that have targeted a similar behavior. Social-marketing programs are most effective when targeted at high-impact behaviors that have high plasticity. Although social and behavioral scientists have considerable experience with plasticity and effective strategies for behavior change, impact is best evaluated by natural or physical scientists.

Cross-Disciplinary Collaborations

Given the fundamental link between conservation and human behavior, conservation efforts led by natural scientists would be well served to involve social and behavioral scientists. Expertise in human behavior can be found in disciplines including but not limited to economics, political science, sociology, anthropology, communication, marketing, and psychology. Much of the work in these disciplines utilizes the same empirical methods familiar to biologists, including measurement and quantification, observation, correlation, and experimentation.

One notable effort to promote collaboration among conservation social scientists and conservation biologists is the Social Science Working Group within the Society for Conservation Biology (Mascia et al. 2003). Formed in 2003, the working group now consists of more than 700 natural scientists, social scientists, and practitioners. The group organizes symposia and workshops, supports short courses, and facilitates collaboration.

A second example of collaboration among social and natural scientists is the emergence of conservation psychology (Saunders 2003; Clayton & Myers 2009). Psychological science has much to offer conservation science, and there is a wealth of relevant theory and research on environmental problems dating back more than 40 years. Conservation psychology draws heavily on the contributions of environmental psychologists and facilitates conservation efforts by fostering collaborations between natural and behavioral scientists. It is both a discipline and a network of practitioners and researchers who work together to understand and promote sustainable uses of nature (Saunders 2003). The growing involvement of behavioral scientists in conservation science is reflected in the recent name change of the American Psychological Association Division 34 to Society for Environmental, Population, and Conservation Psychology.

Conservation biologists can play a central role in promoting changes in human behavior. In part, lack of widespread change in behavior has resulted from an overemphasis on knowledge and awareness in conservation efforts, social and cognitive biases that result in misperceptions about the current and proximal severity of environmental problems, reductions in connectedness with nature brought about by technology-mediated lifestyles, and difficulties in challenging social norms. In advancing the science and practice of conserving biological diversity, conservation biologists would be well served to identify high-priority behaviors that need to change, to look beyond simple education and awareness campaigns, and to partner with social and behavioral scientists.

About the Author

Wesley Schultz is professor of psychology at California State University, San Marcos. His research interests are in applied social psychology and in using psychological theories and methods to understand and solve social issues. In recent projects he has focused on science training programs, science education related to climate change, and behavioral solutions to environmental problems.

Literature Cited

Balmford, A., and R. Cowling. 2006. Fusion or failure? The future of conservation biology. Conservation Biology **20:**692–695.

Cialdini, R. B. 2003. Crafting normative messages to protect the environment. Current Directions in Psychological Science **12:**105–109.

Cialdini, R. B., L. J. Demaine, B. J. Sagarin, D. W. Barrett, K. Rhoads, and P. L. Winter. 2006. Managing social norms for persuasive impact. Social Influence **1:**3–15.

Clayton, S., and G. Myers 2009. Conservation psychology: understanding and promoting human care for nature. Wiley-Blackwell, Hoboken, New Jersey.

Costanzo, M., D. Archer, E. Aronson, and T. Pettigrew. 1986. Energy conservation behavior: the difficult path from information to action. American Psychologist **41:**521–528.

Cowling, R. 2005. Maintaining the research-implementation continuum in conservation. Society for Conservation Biology Newsletter **12:**19.

Crompton, T. 2008. Weathercocks and signposts: the environment movement at a crossroads. World Wildlife Fund, Godalming, United Kingdom. Available from wwf.org.uk/strategiesforchange (accessed May 2011).

Dietz, T., G. Gardner, J. Gilligan, P. Stern, and M. Vandenbergh. 2009. Household actions can provide a behavioral wedge to rapidly reduce U.S. carbon emissions. Proceedings of the National Academy of Sciences **106:**18452–18456. Available from http://behavioralwedge.msu.edu/documents/behavioral_wedge_paper.pdf (accessed May 2011).

Ehrlich, P., and D. Kennedy. 2005. Millennium assessment of human behavior. Science **309:**562–563.

Fisher, J. D., W. A. Fisher, and P. Shuper. 2009. The information-motivation-behavioral skills model of HIV preventive behavior. Pages 21–65 in R. DeClemente, R. Crosby, and M. Kegler, editors. Emerging theories in health promotion practice and research. Wiley & Sons, San Francisco.

Gifford, R, et al. 2008. Temporal pessimism and spatial optimism in environmental assessments: an 18-nation study. Journal of Environmental Psychology **29:**1–12.

Gosling, E., and K. Williams. 2010. Connectedness to nature, place attachment and conservation behaviour: Testing connectedness theory among farmers. Journal of Environmental Psychology **30:**298–304.

Keizer, K., and P. W. Schultz. 2011. The role of social norms in understanding and changing pro-environmental behaviour. In press in L. Steg, A. van den Berg, and J. de Groot, editors. Environmental psychology. Wiley-Blackwell, Malden, Massachusetts.

Keizer, K., S. Lindenberg, and L. Steg. 2008. The spreading of disorder. Science **322:**1681–1685.

Leiserowitz, A., R. Kates, and T. Parris. 2005. Do global attitudes and behaviors support sustainable development? Environment **47:**22–38.

Mascia, M., J. P. Brosius, T. A. Dobson, B. Forbes, L. Horowitz, M. McKean, and N. Turner. 2003. Conservation and the social sciences. Conservation Biology **17:**649–650.

Mayer, S., and C. Frantz. 2004. The connectedness to nature scale: a measure of individuals' feeling in community with nature. Journal of Environmental Psychology **24:**503–515.

McKenzie-Mohr, D. 2011. Fostering sustainable behavior. 3rd edition. New Society Publishers, Gabriola Island, British Columbia.

McKenzie-Mohr, D., N. Lee, P. W. Schultz, and P. Kotler. 2012. Social marketing to protect the environment: what works. Sage, Thousand Oaks, California.

Moore, D. W. 2002. Public leans toward conservation approach to environmental policy. Gallup Poll Monthly (March) **438:**35–38.

Sarkar, S., A. Aggarwal, J. Garson, C. Margules, and J. Zeidler. 2002. Place prioritization for biodiversity content. Journal of Biosciences **27:**339–346.

Saunders, C. 2003. The emerging field of conservation psychology. Human Ecology Review **10:**137–149.

Schultz, P. W. 2001. Assessing the structure of environmental concern: concern for self, other people, and the biosphere. Journal of Environmental Psychology **21:**1–13.

Schultz, P. W. 2002*a*. Knowledge, education, and household recycling: examining the knowledge-deficit model of behavior change. Pages 67–82 in T. Dietz and P. Stern, editors. New tools for environmental protection. National Academy of Sciences, Washington, D.C.

Schultz, P. W. 2002*b*. Inclusion with nature: understanding the psychology of human-nature interactions. Pages 61–78 in P. Schmuck and P. W. Schultz, editors. The psychology of sustainable development. Kluwer, New York.

Schultz, P. W. 2010. Making energy conservation the norm. Pages 17-1–17-12 in K. Ehrhardt-Martinez and J. Laitner, editors. People-centered initiatives for increasing energy savings. American Council for an Energy Efficient Economy, Washington, D.C. Available from http://www.aceee.org/people-centered-energy-savings (accessed May 2011).

Schultz, P. W., and F. G. Kaiser. 2012. Promoting proenvironmental behavior. In press in S. Clayton, editor. Handbook of environmental and conservation psychology. Oxford University Press, Oxford, United Kingdom.

Stern, P. C. 2000. Toward a coherent theory of environmentally significant behavior. Journal of Social Issues **56:**407–424.

Uzzell, D. L. 2000. The psycho-spatial dimension of global environmental problems. Journal of Environmental Psychology **20:**307–318.