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The Frederick S. Pardee Center for the Study of the Longer-Range Future

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ISSUES IN BRIEF

Changing Conservation Behavior by Changing the Behavior of Conservation Programs

Kira Sullivan-Wiley is an environmental social scientist using tools from the spatial sciences, behavioral sciences, and qualitative social sciences in a coupled human-natural systems framework. She uses these tools to study how environmental behavior is shaped by environmental cognition, social and biophysical context and dynamics, and interventions. Her work focuses on people with resource-based livelihoods, who are often at the intersection of environmental and economic interventions. Sullivan-Wiley's work aims to improve the human condition through a healthier human-environment system. She is currently a Postdoctoral Associate at the Pardee Center for the Study of the Longer-Range Future.

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Over the last several decades, the environmental conservation and economic development communities have begun to converge on the idea that environmental and social systems are intertwined. The idea has evolved from one that pitches the environment against development, to one that suggested a balance between them, to the current thinking that there might be opportunities for both to flourish simultaneously (Bennett and Roth, 2015). This recent concept of the co-benefits among environmental and social aims is most apparent in the context of the Sustainable Development Goals (SDGs), a set of 17 aims set forth by a United Nations-led effort in 2015. These goals, and the research around them, recognize the co-benefits of pursuing improvements across multiple sectors simultaneously, including climate, nutrition, food, water, and health. Forward movement in each of these areas relies on the mutual and sustained improvement of intertwined social and environmental systems into the longer-term future.

Global recognition of these interdependencies provides a framework critical to academics and practitioners. Still, there remains much to be done to integrate social and environmental systems in the conservation sphere. Environmental conservation faces significant challenges to long-term success, including continuing declines in global biodiversity, increasing climatic uncertainty, and water contamination and shortages. Addressing all of these challenges, for both environmental and human well-being, will require large-scale change in environmental protection efforts and natural resource management. It will require individual people to change how they live and what they do, on a global scale.

In the realm of environmental and conservation action, such changes by individuals might be termed "pro-environmental" or "pro-social" behavior. These are behaviors that must be taken by an individual and that benefit the broader community. In many cases, to take these actions, there is some cost that accrues to the individual. This can be either a material cost (e.g., the cost of changing out light bulbs, planting native trees, or using environmentally-friendly pest control measures) or the time and energy cost of learning about and implementing a new action (e.g., cooking vegetarian meals at home, cultivating wildflowers in the garden, voting for a pro-environmental ballot measure).

Approaches to Achieving Conservation

For decades, conservation organizations, from town land trusts to global environmental non-government organizations, have worked to protect the very systems on which human well-being relies — protecting ecosystem services by protecting the ecosystems themselves. While each organization has a different model, most of this work falls under two umbrellas: putting land aside (preservation), or changing how it is managed, usually for multiple uses or purposes (conservation). Though land trusts and conservancies still spend a large proportion of their resources on acquiring land for preservation, an increasing focus has shifted to resource use and management. This approach accepts that people will be using the resources that need to be conserved or maintained, so conservation action focuses on *how, when, to what extent,* and *by whom* these resources can be used and still achieve conservation (and sustainability) goals. This pro-environmental work relies on a foundation of natural science to inform what should be done.

The Limits of Natural Science

Natural science can tell us many things. For example, it can tell us about the effects of fertilizer runoff on dead zones in downstream waterbodies. It can tell us about the effects of trawl nets on coral reefs and fish populations. It can tell us about the effects of deforestation on local microclimates and drought conditions. These are all critical understandings, but natural science cannot tell us how to help the farmer to change how much fertilizer he applies, or the fisher to change which nets she uses, or the landholder to change forest management practices. Changing people's behavior requires a different kind of science.

Behavioral Science

Behavior change science is a subfield that combines economics, psychology, and other social sciences to improve our understanding of what actually *works* to get people to change. For too long, most pro-environmental and pro-social work operated under what is known as the "information deficit hypothesis." This hypothesis states that people make 'bad' decisions (to use too much fertilizer, to use destructive nets, or to deforest land) because they just do not know any better. Changing these decisions, then, would merely be a matter of providing decision makers with the right information. They would do what was right for themselves, and for their fellow citizens.

Both academics and practitioners have challenged this hypothesis. Critics point out that decision-making, and the behaviors that result from those decisions, are the result of a complex and evolving set of interacting factors, from personal neurobiology to social and cultural norms (see e.g., Sapolsky, 2017). One model links behavior to deeply seated values that are slow to change, emphasizing that a focus on behaviors is more likely to achieve more rapid effects (Manfredo 2008). The physical and psychological factors that influence choices and behavior are referred to as the "choice architecture" (Thaler and Sunstein, 2009). Thaler and Sunstein argue that in order to change a particular behavior, one or more of these factors must be 'nudged' away from its previous condition, a concept that helped to earn Thaler the Nobel Prize in Economics in 2017. These approaches complement educational and market-based approaches in their maintenance of decision-maker independence (in contrast to regulatory approaches).

Behavior Change Required for Conservation

International conservation agencies such as The Nature Conservancy (TNC), Conservation International (CI), and the World Wildlife Fund (WWF) are working to change the behavior of resource users — fishers, hikers, boaters, foresters, voting public, politicians, farmers, and

community members. In order to achieve global conservation goals (e.g. SDGs related to clean water, climate action, life below water, and life on land) and protect the ecosystem services on which people rely, preservation areas alone are insufficient. These preservation approaches are problematic in their own right, potentially displacing indigenous people and other communities, suffering from poor or insufficient management, and being subject to political whim (Mascia and Pailler, 2011; Naughton-Treves et al., 2006). With up to 1.7 billion people dependent on forests for their livelihood, including 200 million indigenous people (Langat et al., 2016), straightforward enclosures and national parks cannot protect our natural resources, either sustainably or equitably. These 1.7 billion people, and the billions of others whose decisions affect ecosystem health and services, must all be a part of the solution.

Conservation organizations understand achieving conservation impacts on a large scale requires working not only with professional resource managers, but also with communities and individuals. Together, organizations and private individuals can promote behaviors that reduce harmful outcomes and make farmland, backyards, coastlines, and other privately-owned resources flourish and also support local people. This will mean a shift from business as usual across a range of sectors: from energy use and the consumption of food and goods, to how we travel and how we directly manage our lands and waters as individuals. While much of the effort by large, international non-governmental organizations (NGOs) will focus on large landholders in rural areas, there is increasing attention to smallholders and urban communities and the outsized effect their decisions can have on ecosystems.

On the global stage, groups such as the World Bank, the United Nations Environment and Development Programmes, state-based international development agencies, and philanthropic foundations are increasingly looking to projects with key linkages between the environment and economic development. Strategies such as "climate smart" development and "nature-based solutions" often rely on changing land use or land management by farmers and other resource users in places with high conservation potential and high rates of poverty.

Even preservation-focused organizations recognize the centrality of human behavior in achieving organizational missions. In many cases, the behavior in question is signing a petition, calling a senator, or providing a donation. Groups like the Sierra Club, the Natural Resource Defense Council, Greenpeace, Environmental Defense Fund, and others rely on these at-home activism behaviors to support their in-house legal, advertising, and lobbying efforts that are intended to make change on a larger scale.

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While all of these organizations and agencies require people to change their behavior, the behavioral science underlying their programs is seldom discussed or examined. The application of behavioral science has been demonstrated with success in fields such as public health, for example with the CARES program in the Philippines that helped people trying to quit smoking become 53 percent more likely to succeed. The Save More Tomorrow program, related to employment-based retirement savings, is credited with increasing savings rates where it has been implemented. Those who received this nudge ended up saving nearly the maximum legal amount (15 percent of salary) after three years, compared to nine percent for those who received only information and a recommendation, or 6 percent for those who received no intervention (Thaler and Benartzi, 2004). While successful examples in public health and finance exist, examples in the realm of conservation remain few.

Examples of Behavioral Science in Conservation

While it is clear to conservation organizations that they need to work with people to change their behavior in order to achieve sustained environmental benefits and conservation, it is less clear that these organizations are embracing and applying social science and insights from behavioral sciences in order to achieve results. A handful of recent examples, however, may indicate that there is a nascent movement in the direction of change within these organizations.

In order to qualify as behavioral science work, a project needs to intentionally apply a behavioral insight, gather scientific data to guide its application to change behavior (ideally in an experimental design), and then measure outcomes in order to determine causality. One of the best-known examples of behavioral science work in an environmental context was a study by OPOWER, a software company providing energy efficiency services to utilities, which conducted a randomized controlled trial for an energy utility in Minnesota. This study found that by providing energy customers with information about the energy use of their neighbors and with ways to reduce their own consumption, consumption rates fell by approximately two percent, comparable with the effects of a small price increase, but without the economic impact (Allcott 2009). In 2019, scientists at The Nature Conservancy ran a behavioral experiment with farmers in the United States Midwestern region to test whether the inclusion of a model tenant farmer lease (as a behavioral nudge) or a financial incentive, would increase the rate at which tenant farmers used cover crops on their farms. The results from this work demonstrate that neither the nudge nor the financial incentive had a statistically significant effect on adoption, results that will inform future efforts by TNC (Weigel et al., in prep). These results also help to illustrate the importance of testing behavioral hypotheses experimentally; nudging different aspects of the choice architecture to see what is most likely to work.

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Cinner (2018) argues that the integration of behavioral science into conservation work has potential, but that practitioners lack an appropriate operational framework to make it happen. In essence, to implement behavior change science for conservation, we need to apply a behavior change approach to the practitioners themselves. What are the barriers they face in doing behavior change work? Through what mechanisms can they be nudged to change how they do 'conservation'?

Barriers to Behavior Change in Conservation Organizations

As noted above, in behavior science the underlying factors that lead to a behavior are referred to as the 'choice architecture'. Based on a series of interviews with conservation practitioners and a review of relevant literature, I have identified five elements of practitioners' choice architecture that likely make incorporating behavioral techniques into their work more difficult. These five elements relate to various characteristics of conservation organizations: *expertise; program goals; monitoring reporting, and evaluation requirements; training resources;* and *funding for innovation* (Table 1).

The first relevant element relates to internal *expertise* of the organization. Conservation agencies tend to focus scientific personnel on ecological expertise and invest significantly less in cultivating internal expertise in social sciences, specifically behavioral science (Bennett et al., 2017). For conservation practitioners who are interested in incorporating behavioral science into program design, there are limited opportunities to call on colleagues with the

Table 1: Elements of organizational structure that constrain conservation scientists and project managers from incorporating behavior change and other social science knowledge into conservation projects.

Element	Status	Change needed
Expertise	Principal focus on expertise in ecology, sporadic expertise in social sciences, especially traditional economics	Build internal capacity in behavioral sub-disciplines of, e.g., economics, psychology, and geography
Program goals	Principal focus is on environmental goals	Formalize behavioral goals in project descriptions and justifications to make them measurable.
MRE requirements	Principal focus of monitoring, reporting, and evaluation (MRE) is on environmental outcomes.	Require monitoring, reporting, and evaluation of behavioral outcomes in order to assess behavioral program goals.
Training resources	Few resources dedicated to training personnel in social science and behavioral techniques	Dedicate more training time and curate resources to build internal capacity in the social sciences.
Innovation funding	Funding for experimentation is allocated primarily to ecological tests	Supplement ecological experimentation resources with funding for behavioral projects to create and establish behavioral tools in the project toolkit.

relevant expertise within the organization. Seeking outside expertise requires additional effort, which stymie otherwise interested parties and discourage the inclusion of behavioral approaches. Of 6,257 publications by authors from TNC, CI, or WWF, only 361 mention behavior, and 239 of these have only been since 2010.

The second element relates to identifying *program goals.* Institutional norms in conservation organizations focus more on environmental or conservation outcomes than behavioral outcomes. When social implications are considered, programs more often frame social goals in terms of program activities (sharing expertise and knowledge with stakeholders) than on actual changes in behavior based on program activities. This framing focuses attention and energy on behavior as an implicit goal rather than an explicit goal that can be assessed alongside environmental goals in terms of its relevance, feasibility, and measurability.

Related to program goals is the third element: institutional expectations on *monitoring, reporting, and evaluating* behavioral outcomes. There is little activity within conservation organizations to allocate time, energy, or resources to gather behavioral data, evaluate program efficacy with respect to behavioral outcomes, or report these outcomes (Sievanen et al., 2012). This can largely be traced back to how program goals are articulated. Without explicit expectations that behavioral outcomes will be measured, analyzed, and reported, these outcomes are more easily deprioritized and their results assumed rather than measured.

The fourth element relates to *resources for training* and support. Beyond the cultivation of internal expertise, which would provide a helpful human resource to the organizations more broadly, conservation agencies seldom provide direct and consistent social science training to their natural scientists and project designers. Scientists and program managers, even if motivated, are left with few resources to help them develop, execute, and evaluate program efficacy with respect to changing behavior.

The final element relates to the cost of the change and a lack of dedicated *funding to innovate,* experiment, and build knowledge within the organization. There is a great deal of variability in the behavioral change techniques that can be used to nudge behavior. Determining what technique would be appropriate in a given situation and testing its efficacy depends on a number of factors. It will depend on the target actor (consumers, resource users, leaders, policy-makers, project designers, or other types of stakeholders), what type of behavior is being targeted (repeated or discrete; costly or cheap; under high or low uncertainty; visible or private), and the type of resource governance system (private, public, or community/group) (Cinner, 2018). Determining which technique will work in which context can be labor-, time-, and energy-intensive, representing a significant cost to these organizations and agencies. This is true even if it remains a more cost-effective tool for achieving sustained behavioral change.

A Way Forward

As it stands, motivated program designers and managers are constrained by these organizational factors in their desire to apply behavioral insights in their work in order to change conservation behavior. Conservation organizations could take discrete actions to address some or all of these issues (Table 1).

(1) To address low levels of internal expertise, conservation organizations might hire social scientists specializing in behavior, from sub-disciplines such as behavioral psychology, behavioral economics, behavioral geography, and behavioral sociology. Depending on the structure of the organization, these scientists could be based in central offices that are linked or available for internal consultation to other branches of the organization (Bennett et al, 2017). Alternatively, organizations could formalize relationships with behavioral or social science consultation groups, recognizing that social science contributions will be greatest if they are included from the beginning of the project planning process (Sievanen et al., 2012; Bennett et al. 2017).

(2) To address the tradition of using environmental rather than social goals to guide project design, organizations can encourage designers and managers to include specific behavioral outcomes as goals in their program design. This could be accomplished in a hierarchical way, with leadership formalizing a consideration of behavioral outcomes into design requirements. It could also be done less formally by individuals within the organization sharing the new design element as an innovation, a strategy that could have greater success (Masuda et al., 2018).

(3) In order to encourage monitoring, reporting, and evaluation related to behavioral outcomes, organization science offices and leadership should require the same level of rigor in measuring, assessing, and reporting behavioral outcomes as is required for environmental outcomes. For example, trees planted in a reforestation project are likely to be monitored for survival rates, perhaps biomass accumulation, and other metrics that would allow project managers to evaluate the extent to which their intervention resulted in a beneficial environmental outcome. Similarly, project designers should design behavioral metrics to determine if the intervention resulted in beneficial behavioral changes. This could mean gathering survey data at multiple time points throughout the project to assess intervention success, or adopting an experimental approach using a randomized controlled trial where some people receive the intervention and other people do not, so that measured behavioral differences can be attributed to the intervention with more confidence.

(4) While hiring social scientists as core experts in the organization may be best in the long term to improve conservation outcomes (Bennett et al., 2017), it may not always be feasible in the short term. An important early step may be to train non-behavioral social scientists

in the methods and theory of behavioral insights. Organizations could strategically train personnel that sit at the boundary of multiple groups (across themes or geographies) to make their expertise more visible and impactful in the organization (Sievanen et al., 2012). These materials could also be a curated set of references for project managers to refer to as they try to conceptualize new projects using a social or behavioral lens (Sullivan-Wiley et al., in prep).

(5) Finally, to mitigate the costs of integrating behavior expertise, theory, monitoring, reporting, and evaluation into projects, organizations can invest in building internal capacity and institutional memory to leverage past experience for future endeavors. For example, the organization could maintain a database of projects that included behavioral goals and record information for each project about the behaviors targeted, the techniques used, what behavioral outcomes were recorded, and the process and results of any evaluation.

Conclusion

Achieving goals for improved environmental and human well-being will require large-scale changes in individual behavior. Conservation and environmental organizations are on the forefront of these efforts, in many cases with existing programs and personnel across geographies and systems throughout the world. Yet these organizations are not integrating social sciences, and especially behavioral sciences, into their programs to the extent necessary to bring about that level of change.

The current operational practices of these organizations constrain project designers and managers from implementing behavior change and other social science theories and tools into their projects. Organizations can alleviate these constraints by *changing hiring and training practices* to increase in-house expertise; *modifying expectations and requirements* for goal development and how behavioral outcomes are monitored, recorded, and evaluated; and in *providing support for experimental projects* that are then logged in a database to reduce inefficiencies over time. These changes will require investment, but the potential gains outweigh the direct costs, and may provide one of the lowest-cost ways to achieve conservation and development goals without reducing the rights and privileges of local populations.

Respecting and integrating local rights is paramount in any discussion of behavior change. While behavior change techniques and insights from behavioral psychology and economics may provide efficient and effective solutions for sticky behavioral challenges, any intervention must adhere to the highest principles of ethical conduct and take into account issues of equity, justice, and fairness throughout the life of the project. ●

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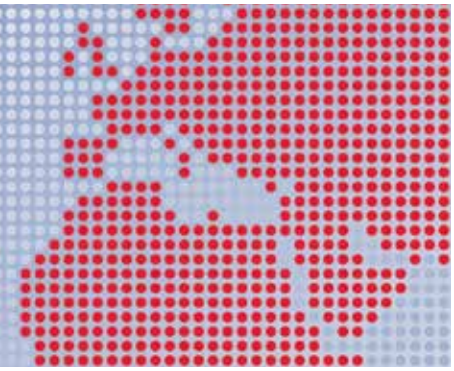

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