Conservation Biology

Editorial

Navigating Environmental Attitudes

One of the anomalies of modern ecology is that it is the creation of two groups each of which seems barely aware of the existence of the other. The one studies the human community almost as if it were a separate entity, and calls its findings sociology, economics, and history. The other studies the plant and animal community, [and] comfortably relegates the hodge-podge of politics to "the liberal arts." The inevitable fusion of these two lines of thought will, perhaps, constitute the outstanding advance of the present century.

Aldo Leopold, Berlin (1935)

There has been progress toward the hopeful words Leopold penned 75 years ago regarding the fusion of ecological and social sciences (quoted in Meine 1988). Environmental sociology, environmental psychology, and resource economics have emerged within their respective disciplines. Journals for interdisciplinary studies of natural resources have been established. Integrated natural and social science training programs have been funded and students graduated. Natural scientists have stepped over disciplinary boundaries to conduct attitude studies. And, this is a problem.

Although fundamentally important, attitudes are a difficult concept operationally and theoretically. The properties of an attitude are not those of a wolf or a fish or even a subatomic particle. Where is an attitude born? How much does it weigh? How fast does it grow? What are its coordinates? Describing attitudes is a bit like describing ghosts. Nevertheless, after nearly 100 years of scientific study, social psychology has developed sophisticated theories about attitudes and sound methods to measure them.

Even though I teach in a wildlife program, it would never occur to me to design and implement surveys of geese or moose—nor would my colleagues consider those surveys credible. But some conservation scientists and students with no training in either the theory or methods of studying attitudes plunge into investigations of what seems to them "just common sense."

Because *attitude* is used in everyday language, those who initiate studies of attitudes are misled not because they know too little about attitudes, but because they think they know enough. And, as the saying goes, it ain't what you don't know that gets you into trouble. It's what you know for sure that just ain't so.

The first thing these amateur attitude researchers miss is that attitudes and behavior are distinct and typically are not highly correlated. Setting and factors outside the individual have far more influence on what people do than beliefs, knowledge, or emotion—the drivers of attitudes. After Leopold wrote his famous essay "Thinking Like a Mountain" that documented his changed attitude toward wolves, he voted as a Conservation Commissioner to restore bounties on the last wolves in Wisconsin (Meine 1988). Leopold defenders will be quick to point out all the extraneous factors that may explain his behavior. This illustrates my point exactly: any single act is influenced by the situation as well as other attitudes, not just one's feelings about, for example, wolves.

Attitudes seem to have a lot to do with behavior because one neglects the nonconforming cases. For example, our research in Sweden showed (see Ljung et al. 2012 for a description of the data and methods) that of 84 people who had negative attitudes toward hunting, none hunted (Table 1). One might say, exactly, no one would expect people who hate hunting to hunt. We also found that none of the 31 hunters had negative attitudes toward hunting. Again, one would not expect people who hunt to dislike hunting. So, attitudes obviously have a lot to do with behavior. The problem is the 337 people (75%) surveyed who had a positive attitude toward hunting did not hunt. Hunting is a behavior. To hunt one must be part of a social network of hunters, learn how to hunt, and have the skills, opportunity, and resources to hunt. The correlation between attitude and behavior in this sample is 0.30. Thus, attitude in this data set accounts for $<10\%$ of the variance in behavior, which is typical. Attitude is often, as in this case, a necessary but not sufficient condition for behavior.

Because many conservation biologists believe attitudes *are* behavior, they often propose to change behavior simply by educating the public. The knowledge-deficit model, or cognitive fix as I like to call it (Heberlein 2012), usually fails because it is difficult to change attitudes and because attitudes have so little to do with behavior. Wesley Schultz, a leading social psychologist, concluded recently on the pages of this journal, "results of psychological studies have shown consistently that increasing knowledge through education, whether related to health,

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Table 1. Attitudes toward hunting and hunting behavior among a random sample of the Swedish population between the ages of 16 and 65.

	Attitude	
Reported behavior	*antihunting*	*prohunting*
Hunt	0	31
Do not hunt	84	337

safety, or conservation, does not lead to a change in behavior" (Schultz 2011).

The weakness of the knowledge-attitude link is shown in attitude studies in Michigan (U.S.A.), where Kellert (1990) found no relation between support for wolf restoration and knowledge of the ecology of wolves. So educating the public would not appear to increase public support for restoration. In Sweden there also was no relation between knowledge and support for wolves (Ericsson & Heberlein 2003). In both cases, groups that knew the least about wolves liked them the most. Should we then try to increase support for wolves by de-educating the public?

As the number of hunters decreases, some want to reverse the trend by making attitudes toward hunting more positive. Now suppose I could magically educate the antihunters represented in Table 1 to like hunting. Even if I could get all 84 to change their attitude, the number of hunters would increase by only 8, assuming their behavior would be distributed as is that of the current population of pro-hunting Swedes. If we want to increase the number of hunters, we must instead reduce barriers to hunting for those 337 people with pro-hunting attitudes who do not hunt. Changing attitudes of those who hate hunting to increase the number of hunters is hopeless.

Even if attitudes are not easily changed, attitudes do change as people gain direct experience. This is why Leopold's attitudes changed from antiwolf to prowolf as he saw with his own eyes over decades (not weeks or even years) the results of predator eradication. Wolves have returned to Sweden and attitudes toward wolves have changed. People in rural areas are now less positive toward real wolves that have killed pets, livestock, and hunting dogs. This is perfectly reasonable and understandable from attitude theory; direct experience counts.

Other researchers have documented a similar decrease in positive attitudes toward wolves in Wisconsin and worry that it will lead to poaching. I am not as worried because of the frequent, consistent, and powerful gap between attitudes and behavior and even between behavioral intentions (i.e., what people say they intend to do) and observed behavior. People whose attitudes change from neutral to a slight dislike of wolves are not going to become poachers. Poaching is a behavior. It is against the law and subject to fines or jail time. Poaching needs to be studied on its own by those who are experts on unlawful behavior. But the simple and predictable change in attitudes as wolves return should not be used to justify draconian measures to prevent the mere possibility of poaching. Such measures in and of themselves could be counterproductive because they would provoke those who currently act unlawfully to poach wolves.

This is not to say that attitudes are unimportant. They fundamentally shape the kinds of alternatives and policies available for social change. We need to know more about attitudes, but we need to go beyond the simple notions that attitudes and behaviors are virtually the same thing and that changing attitudes is the best way to solve environmental problems.

Before conservation biologists and others plunge into the social sciences they need training. Reading a few review articles about attitudes is not sufficient. What is required is the kind of hands-on apprenticeship one receives in the best social science graduate programs. There are full courses on attitudes and social influence, survey design, and statistical analyses of attitude data. Perhaps some serious training in the social sciences should be established for postdoctoral fellowships in conservation biology so conservation biologists can be better armed to head into the thorny world of attitudes.

Another solution for natural scientists is to collaborate with social scientists as equal partners. Often research teams recruit a graduate student in sociology or economics (by definition a graduate student is still in training). In my experience, this inequality in status, power, and experience has been a disaster for all involved. Alternatively, an esteemed professor in the social sciences could be involved in a research project. But I have seen these collaborations go awry when theoretical issues in the disciplines become stronger drivers of the research agenda than the environmental problem itself. Social science may be advanced, but the environment is not improved.

Collaborations among natural and social scientists are most often successful when a well-balanced team has strong leadership and works together using multiple methods rather than just conducting a hastily developed survey. For example, E. J. Milner-Gulland's team examined the role of attitudes on poaching saiga (*Saiga tatarica*) in three countries of the former Soviet Union (Kühl et al. 2009). A Russian anthropologist from the study area and conservation biologists from the United Kingdom (all of whom learned at least one of the local languages) spent 3 years doing field work together. All of the interviews to assess attitudes and knowledge were conducted in the local language that the interviewee was most comfortable with. Poaching behavior was measured independently by three local residents rather than relying on self-reporting of the households. The results of this careful investigation of 444 households in 5 villages showed what social psychologists would expect: "there

is no association between attitudes and poaching." The researchers found rather that "exploitation of the saiga antelopes is directly linked to poverty and unemployment," and they concluded, as I argue here, "positive attitudes toward a resource are not necessarily linked to positive conservation action."

I understand there is great interest among conservation biologists to investigate problems that have human dimensions. I urge you not to take on attitudes alone, but to bring in a critical mass of social science and regional expertise. Take the time to do the study right, and pay attention to behavior and its structural causes. Realize that attitudes are important, but they are not everything. Only then will human dimensions of biological conservation join the natural sciences as equal partners to produce the fusion that Leopold envisioned. We did not reach that vision in his century, but we can in ours.

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