

Advances in Ethnobiological Field Methods

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This article serves as an introduction for a special issue of Field Methods titled "Field Methods in Ethnobiology." The contribution of ethnobiological research to the development of methods in the social sciences is explored in a historical perspective. A summary of the articles found in the special issue is presented.

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Ethnobiology is the scientific and humanistic study of the complex set of relationships of the biota to present and past human societies. As such, there are many ways the discipline can contribute to research techniques and methods in the social sciences. The field can be divided into three major domains of inquiry: economic (how people use plants and animals), cognitive (how people know and conceptualize plants and animals), and ecological (how people interact with plants and animals, especially in an evolutionary and co-evolutionary framework). Ethnobiology can be further parsed into two subdisciplines: ethnobotany and ethnozoology. Given the greater importance of plants than animals for most human societies, ethnobotanical studies form the vast majority of research within ethnobiology. Scholarship in all these areas has contributed to methodological advances, although contributions from cognitively oriented ethnobiology have been most significant for the social sciences.

For many years, *Field Methods* (and its predecessor *Cultural Anthropology Methods*) has been publishing articles either directly related to ethnobiological methods on topics such as ethnoentomology (Kendall et al. 1990), home gardens (Wichramasuriya and Pelto 1991; Vogl, Vogl-Lukasser, and Puri 2004), and knowledge of plant use (Reyes-García et al. 2004) or indirectly through innovations in research techniques that are often used by ethnobiologists (e.g., freelisting, triads, pile sorts, and cultural consensus analysis). With a growing interest in the field of ethnobiology as evidenced by a tremendous rise in course offerings and graduate programs, it

seems an appropriate time for a special issue devoted to field methods in ethnobiology.

In recent years, many of the methods used by ethnobiologists have been compiled into field manuals, most notably the series titled "People and Plants Conservation Manuals," developed by the World Wildlife Fund/UNESCO/Kew Royal Botanic Gardens as part of the People and Plants Initiative (e.g., Martin 1995; Tuxill and Nabhan 1998; Cunningham 2000). Another well-received methods manual was developed at the New York Botanical Garden (Alexiades 1996). This collection, then, is the latest contribution devoted to methods in ethnobiology, although it will likely not be the last. The articles contained here are by no means a comprehensive portrait of methodological innovations taking place in the field today. Rather, they represent a broad range of inquiry and development focused on improving methodological rigor and testing new ideas and hypotheses, and they build on many of the techniques described in the volumes noted above.

PREVIOUS METHODOLOGICAL CONTRIBUTIONS FROM ETHNOBIOLOGY

Although ethnobiology has been criticized for having a preoccupation with list making and lacking theoretical rigor, a surprising number of methodological advances have come from research on human knowledge and use of, and interactions with, plants and animals. Even more, descriptive studies have been valuable to the field in that these basic inventories have provided the foundation for more theoretical studies (Davis 1991). Advances in ethnobiological methods have had the largest impacts in the social sciences within the anthropological subfields of cognitive anthropology and, to a lesser extent, medical anthropology and ecological anthropology. Of course, the borrowing of research techniques is seldom unidirectional from one field to another. Also, researchers often draw from several subfields at once, further complicating an attempt to trace the origin of a technique to a particular subfield. Rather than engage in the task of determining whether a contribution comes from the field of ethnobiology proper, I provide a few examples of how ethnobiologically oriented studies by anthropologists and other social scientists have led to advances in our ability to conduct rigorous fieldwork leading to theoretical insights. Thus, this brief review is not meant to be comprehensive but instead will illustrate some general trends and themes in ethnobiology related to research techniques and methods.

Prior to the mid-1950s, research in ethnobiology was primarily descriptive. A large amount of data was collected regarding traditional names and uses of plants and animals for a number of sociolinguistic groups. Within anthropology, researchers were increasingly becoming concerned with understanding emic perceptions of the world. This approach, known as ethnoscience, dated back to the ethnographic approaches of Boas and his students but was relatively obscure until the 1950s. A detailed account of this fascinating history is provided in D'Andrade (1995). With a newfound popularity, anthropologists working in an ethnoscientific framework began looking at domains of cross-cultural importance, most notably kinship, through a nexus of ethnographic, psychological, and linguistic frameworks. A search for other domains of widespread cross-cultural significance led ethnographers to investigate the nomenclature and classification of plants and animals. Harold Conklin's (1954) exhaustive doctoral dissertation research on Hanunóo ethnobotany was highly influential at the time and demonstrated the detailed knowledge that indigenous peoples have of their flora. A decade later, Brent Berlin began his research with the Tzeltal Maya and found striking similarities to Conklin's findings regarding ethnobiological classification (Berlin, Breedlove, and Raven 1974).

A deceptively simple questioning frame based on the question, "What are the names of each kind of X in the world?" was developed that led to the elicitation of native taxonomies. An early use of this was by Metzger and Williams (1966) in their study of Tzeltal Maya categories of firewood. Despite the significance of firewood as a crucial element of survival for the Tzeltal Maya (an importance that continues to this day), this and other ethnoscientific studies were criticized for their focus on supposedly trivial aspects of culture (Berreman 1966). This type of criticism possibly helped prolong the obscurity of ethnobiology as an academic discipline and may have led to many of its contributions to research methods being ignored or overlooked. However, important work continued and ultimately led to the formulation of general principles of ethnobiological classification (Berlin 1992).

Along the way, ethnobiologists found that classification, while patterned, also contained a great deal of variation, depending on a number of contexts related to both the cultural significance of the domain and cognitive variation from informants. Boster's (1985, 1986) work on Aguaruna classification of manioc varieties was instrumental in demonstrating that the more an informant agrees with others about a particular domain, the more knowledge that informant will have. This insight soon led to the development of cultural con-

sensus analysis, a research technique that has proven to have a broad range of application throughout the social sciences (Romney, Weller, and Batchelder 1986). A different take on identifying consensus in ethnobiology was concurrently developed by Trotter and Logan (1986). Rather than reduce variation, some researchers have sought to measure and quantify it in relation to ethnobiological knowledge. The Shannon-Weiner index, derived from information theory in 1940s, is a measure that takes into account the number of different responses (richness) combined with the distribution of those responses (evenness). Begossi (1996) suggested a novel application for this index with ethnobotanical data on use categories of plants.

Ethnobiologists have been at the forefront of participatory methods, developing innovative strategies for training indigenous collaborators (Berlin 1984) and conservation of local resources (Ticktin et al. 2002). Methodological advances have also come from the innovative use of visual stimuli in ethnobiology (Boster and Johnson 1989; Johnson and Griffith 1998). Although there are relatively few ethnobiologists, ethnobiological studies have made many contributions to research methods in the social sciences.

FUTURE DIRECTIONS IN ETHNOBIOLOGICAL METHODS

Despite previous contributions to methods, many researchers are still concerned with a perceived lack of methodological advances in contemporary ethnobiology. To counteract these trends, a National Science Foundation-funded workshop titled “Intellectual Imperatives in Ethnobiology” was organized by Jan Salick in 2002. Among the recommendations of this group were that ethnobiological research be primarily hypothesis driven rather than descriptive and that methodological rigor come from collaborative efforts by practitioners of different disciplines (Ethnobiology Working Group 2003). Ethnobiology is uniquely poised to develop insights that can bridge scientific knowledge and local knowledge. Efforts are under way to standardize methodologies to allow for more comparative research (Stepp and Thomas 2005).

Work that has been done already by researchers working across regions and continents has yielded considerable insight (e.g., Moerman et al. 1999). However, lack of comprehensive ethnofloras and ethnofaunas for most sociolinguistic groups severely hinders attempts at cross-cultural comparison. Meanwhile, ethnobiological knowledge is rapidly disappearing for many sociolinguistic groups, although there are promising signs that it is persisting for some (Zarger and Stepp 2004). It is hoped that this special issue

will provide researchers with new techniques to continue to advance the field and introduce ethnobiology to a wide range of social scientists.

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These articles represent a broad range of methodological innovation and conceptual sophistication, grounded in thoughtful ethnographic research. For the most part, the methods that the authors present have been carefully tested and been proven successful over a long period of time. This suggests that these methods are potentially applicable in a variety of settings and different ethnographic contexts. It is also likely that these methods will continue to be modified and refined over time.

The time-honored technique of freelisting is explored in Quinlan's contribution. Its early use by ethnobiologists was foundational in establishing native taxonomies of flora and fauna. Quinlan reviews its use and finds that the technique still has much to offer ethnobiology today. Drawing on her work on medicinal plants in Dominica, she clearly addresses the strengths and weaknesses of the technique and makes suggestions for improved accuracy.

The work of Brent Berlin and Elois Ann Berlin has spanned four decades and involved long-term fieldwork with Highland Maya in Chiapas, Mexico, and Aguaruna Jivaro in Peru. While their ethnobiological research has covered many topics and domains, their article here is concerned with their work in medical ethnobiology and some of the innovations in field research they have developed over time. They present a framework for data collection that involves the use of local collaborators and allows for a broad-scaled regional approach to ethnobiology. This comprehensive approach to data collection ensures that the range of knowledge variation within a sociolinguistic group is captured, along with a fairly complete portrait of their relationship with the local biota that is used for medicinal purposes. The proof of the utility of such a framework is demonstrated by the enormous database they have developed, and some of the analyses of these data are presented in their article.

Drawing from a substantial background in cognitive anthropology and ethnographic research, Norbert Ross and colleagues present a thoughtful study of Tzotzil Maya ethnobotany involving an innovation using a triad design with a new coding scheme that can then be analyzed for informant agreement through cultural consensus analysis. In doing so, they provide an analytical framework that can be applied to the understanding of categorization and classification.

Moving from a formal cognitive approach to a slightly more applied setting, we find a valuable contribution from Soleri and Cleveland involving the use of scenarios to arrive at an emic understanding of farmers' knowledge. While much has been written lately about the supposed incompatibility of scientific knowledge with local knowledge, their application of scenarios demonstrates that, in fact, the two worldviews share many commonalities and are based on some of the same underlying models.

Participatory research is becoming increasingly more common in the social sciences, and ethnobiologists are contributing to this effort. Medley and Kalibo's article describes ways to engage in participatory ethnobotanical research that can help lead to a better understanding of local environmental knowledge. Using a range of techniques in a participatory setting at Mt. Kasigua, Kenya, they clearly demonstrate the utility of participatory approaches and suggest new ways to conduct ethnobiological and ethnobotanical research.

Taken as a whole, these articles demonstrate some of the best and most innovative research techniques being used in ethnobiology. At the same time, this is only a small sample of the work being done in ethnobiology, much of it involving the application of techniques that are similarly innovative and leading to significant advances in the field. As progress is made, it is hoped that *Field Methods* will continue to revisit the issues raised by these techniques and continue to be at the forefront of field research methodologies in ethnobiology.

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