

Local Environmental Knowledge, Talk, and Skepticism: Using ‘LES’ to Distinguish ‘LEK’ from ‘LET’ in Newfoundland

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Abstract The actual evidence observed in studies of LEK (local environmental knowledge) is nearly always *talk* about the environment, or what we refer to as LET (local environmental talk), with the claim of studying LEK usually being built upon the implicit assumption that talk about the environment is the expression of knowledge about the environment. We suggest that it is critically important for researchers to question this assumption, especially when the distinction between LET and LEK is also emphasized by local people themselves. In the case we present here, residents of small fishing villages on the Northern Peninsula of Newfoundland are routinely skeptical about what other local residents say about the environment; that is, they engage in LES (local environmental skepticism). We suggest that paying explicit attention to LES can help distinguish LEK from LET.

Key words Local environmental knowledge · Local environmental talk · Local environmental skepticism · Anthropological methodology

Introduction

As Roepstorff points out, “[c]omposite concepts consisting of a catchy first word (local, indigenous, traditional, environmental, etc.), followed by *knowledge*, have recently become popular in the applied anthropology literature”

(2000:165; original emphasis). This focus on traditional, local, or indigenous knowledge has been called the “new applied anthropology” that “augurs the next revolution in anthropological method” (Sillitoe, 1998:223). Indeed, the recognition of “the value of traditional knowledge of indigenous peoples, and particularly their traditional environmental knowledge [has] unleashed a flood of research” (Johnson, 1992:v). This has been motivated in part by the possibility that such knowledge serves as a guide to better resource management (McGoodwin and Dyer, 1994), combined with an awareness of “the erosion of IK systems” (Grenier, 1998:4) and of their potential use in securing resource tenure rights for marginalized peoples worldwide. Despite this recent surge in interest, the “concept of TEK [and similar acronyms] draws on two older, somewhat separate research traditions—ethnoscience and cultural ecology” (Neis *et al.*, 1999: 217). Because the actual subject matter of this research is what people say about their environment, this research is actually as old as the discipline of anthropology itself. Yet the failure to fully realize the actual nature of the subject matter has caused us largely to overlook a fundamental problem that is also as old as anthropology itself: What is said about a particular subject is not necessarily what is known about it, and vice versa.

The rapidly expanding field of LEK studies has led to numerous theoretical and methodological refinements, often marked by the introduction of new acronyms into the literature. Indeed, it might seem that the currently existing list of acronyms has now exhausted all potentially relevant debates, and that additional acronyms are unnecessary. However, we argue that two further acronyms will help draw explicit attention to perhaps the most fundamental issue to the entire field, and to one that has not received

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sufficient attention. As Roepstorff shows above, previous discussions have focused on the beginning letters of acronyms (e.g., does the word “traditional” carry negative connotations, or does the word “environmental” include the social environment?), while the letter “K” has remained nearly constant reflecting the common assumption that “knowledge” is the focus of study. Here we introduce two additional concepts (and their acronyms) that draw attention to problems with this assumption: First, the concept of LET refers to local ecological talk, and second, the concept of LES to local environmental skepticism, or more precisely skeptical statements local people make about what other local people say about the environment.

Our argument that these two concepts are necessary is based on the simple fact that the actual evidence observed in studies of local ecological knowledge (LEK) is nearly always talk about the environment (LET) or what people say they know about it. Thus, the claim of studying LEK is usually built upon the implicit assumption that *talk* about the environment is the *expression of knowledge* about the environment. We question this assumption because (1) talk may or may not accurately correspond to the speaker’s knowledge, and (2) talk is a primary form of human communication designed to influence the receivers of such communication.

There are important theoretical reasons for adopting our approach. First, the view that one can assume that LET equals LEK unless there is evidence to the contrary is diametrically opposed to “signaling theory” within evolutionary ecology which holds that “signals are best seen as *attempts to manipulate, rather than inform, other organisms*” (Cronk, 1994:81; our emphasis). Our focus on talk as a means of influencing other people is also consistent with the tremendous interest in the political dimensions of ecological issues within the field of political ecology. Indeed, emphasizing the distinction between LET and LEK is a way to explicitly incorporate the political dimensions of the micro-level political interactions and “environmental discourse” (see Harre *et al.*, 1998; Lenton and Short, 2000; Yearly, 1996) among individuals within local communities into the larger scale political relations between such communities and wider “political units”—the usual focus of political ecology studies (Robbins, 2004:6). For example, our approach allows political ecologists to move beyond their focus on how “competing alliances of state and local groups struggle over the devolution of power” (Robbins, 2000:127), and to examine the environmental discourse and material struggles among individuals within local communities. This is important because, “ecological issues affect practically all spheres of social existence, and accordingly bear on political institutions, processes and policies *at all levels*” (Hayward, 1998:1; our emphasis). Finally, this view of humans as “political

animals” (Hayward, 1998:1) is gaining support from current research about the evolution of the human brain:

Human cognitive abilities are extraordinary...Hypotheses [about why these abilities evolved] based on traditional ecological demands, such as hunting or climatic variability, have not provided satisfying explanations. Recent models based on *social problem solving linked with ecological conditions* offer more convincing scenarios (Flinn, Geary and Ward, 2005:10; our emphasis).

Our approach simply views talk about the environment (LET), including making skeptical comments about what other people say about the environment (LES), as one of the ways humans influence the behavior of other humans in order to solve socio-political problems linked with ecological conditions.

The primary reason, however, for formally distinguishing LET from LEK, and for paying explicit attention to LES, is not the theoretical basis of the argument, but the simple fact that local people themselves do these things. For example, the distinction between LET and LEK is obvious to commercial lobster fishers in Maine who are well aware of how talk about the location and abundance of lobsters varies in different social settings (see Palmer, 1990a, b; 1991a, b; 1993a, b). Similarly, far from being a trivial academic point, the distinction between LET and LEK is also often emphasized by the residents of the study area examined in this paper, the Northern Peninsula of Newfoundland (Palmer and Sinclair, 1996; 1997; 2002; see also Andersen 1973). Instead of assuming that talk about the local environment is the expression of knowledge, these residents routinely engage in LES of what other residents say about the environment, as well as propose political motives for what other people say about the environment. Thus, the explicit incorporation of LET and LES into the study of LEK transforms our view of local residents as just holders and users of ecological knowledge to active agents who use talk about the environment to help shape perhaps the most important part of that environment—the behavior of other humans. Given the importance of these concepts to local residents, there is no justification for researchers to ignore them. The first step in our argument will be to establish that what is typically called LEK, TEK, and IK is usually LET. (As our argument applies to all variations, for the sake of simplicity we will use LEK to refer to all of these).

The Study of LEK is Usually the Study of LET

Researchers who record local people’s talk about the environment routinely assume that they are experiencing local environmental knowledge of the people interviewed. The

underlying assumption is that knowledge is something usually, if not exclusively, manifested and transmitted via language. For example, “TEK is *knowledge*....As knowledge, TEK may be transmitted from person to person, as it has been transmitted for generations in the maintenance of tradition. The medium of its transmission is, to a great extent, linguistic” (Hunn, 1993:4; original emphasis). Similarly, “TEK is recorded and transmitted through oral tradition (often through stories)” (Johnson, 1992:7), and “[f]ishers’ knowledge of fish stocks is primarily oral” (Neis and Morris, 2002:230). Likewise, the “different settings in which knowledge has been shared and exchanged include camp situations, hunting trips, community committee meetings, casual conversations, informal discussions, and formal interviews” (Fleming, 1992:79). The centrality of this assumption to the study of LEK is also reflected in the titles of LEK books: *Voices from the Bay: Traditional Ecological Knowledge of Inuit and Cree in the Hudson Bay Bioregion* (McDonald et al., 1997), *Words of the Lagoon: Fishing and Marine Lore in the Palau District of Micronesia* (Johannes, 1981), and *Lore: Capturing Traditional Environmental Knowledge* (Johnson, 1992).

The assumption that knowledge consists of language understandably leads to the further assumption that knowledge is studied, recorded, captured, collected, or extracted, at least primarily, by having local people talk to the researcher. For example, Maurstad (2000:136) states, “Our first task was to interview fishers, that is, to collect fishers’ knowledge,” with “the primary method of data collection [being] the ethnographic interview, using a structured conversational approach” (Johnson and Ruttan, 1992:49; see also Newell and Ommer, 1999; Atran et al., 2002). This methodology itself rests on the assumption that this talk is “the *expression* of peoples’ views and the knowledge they have acquired from interacting with the...natural world” (Fleming, 1992:85; our emphasis).

The assumption that talk is the expression of knowledge inevitably leads to the conclusion that the more people talk about the environment, the more knowledge we will be able to record. Thus, those of us wanting to study LEK consider ourselves fortunate when people like to talk about the environment: “Pride in fishing skill is matched by pride in knowledge of the ways of fish. Fish behavior is debated and analyzed endlessly by groups of older men as they sit crosslegged in the men’s houses chewing betel nut” (Johannes, 1981:3), while elsewhere “participants found the exercise interesting ... The atmosphere was more like a lively seminar than an interview” (Blurton Jones and Konner, 1989:22). This eagerness to talk about the environment is seen as positive for the study of LEK, even when researchers realize the talk is at least partially politically motivated. For example, Rhiannon and Cross (1992:129) state that, when discussing incorporating tradi-

tional techniques into development projects, “such work is freely commented on by the informants, who forcefully state their own agenda.” Baines (1992:103) writes that the “Marovo people greatly enjoy conversation, and experts on fishing knowledge are no exception,” and sees this situation as positive for the study of LEK even though “Marova villagers show a preparedness to ‘take charge’ of the visiting investigator” (Baines, 1992:102).

Some students of LEK have considered themselves less fortunate because they have encountered situations where interviewees were reluctant to talk about the environment. For example, “the holders of TEK, for their part, are sometimes reluctant to share information, and issues of ownership and control over use of TEK sometimes arise” (Huntington, 2000:1273). Similarly, “Belcher Island Inuit wonder and are cautious about communicating their knowledge to the Western world” (Fleming, 1992:86), and elsewhere locals may keep secrets “because we all have secrets and we don’t want to pass these secrets on to anyone who is not from the same village” (Kone, 1992:137). Likewise in group interviews, some participants may “dominate discussion” while “others may withhold information” (Grenier, 1998:34), deeming some “topics too sensitive to discuss with an outsider, and [possibly] lying” (Grenier, 1998:34). Respondents to formal surveys may also find the “format unfamiliar, uncomfortable, embarrassing, culturally inappropriate, or confusing” (Grenier, 1998:35).

Add to this relatively benign mix of technical obstacles a volatile political–ecological context, and the technical problems compound: In Newfoundland, “high levels of uncertainty, competing points of view, and fear of loss of income tended to discourage public discussion and related initiatives to curtail fishing mortality among these groups” (Power, 2000:194). In this context, a Newfoundland fish plant worker states, “It takes a pretty tough person to stand up and say, ‘Well, I don’t care. I don’t mind my job being lost. I don’t want the fish stocks depleted.’ Who’s going to stand up and say that?” (Power, 2000:196). Thus we have the possibility of subjects keeping secrets and having “conscious, pragmatic motivation” to keep them (Greaves, 1989:27–30). As LEK researchers, we have realized that local people may be reluctant to talk about the environment because that talk may influence those hearing the talk, but we have not fully appreciated the possibility that what people do say may also be motivated by how it will influence other people *beyond the specific environmental context* of that talk.

The assumption that talk is merely the expression of knowledge has also led to great attention being given to finding methods to make subjects talk more about the environment (Fleming, 1992:85), especially when they are reluctant to do so. For example, “[i]ndividual interviews allow the more reserved person to speak freely. On the

other hand, some people may feel uncertain about the knowledge they have and be more at ease discussing their ideas in a group situation” (Grenier, 1998:94). Notice here, despite the implicit acknowledgement that people adjust, or at least constrict, what they say because of its potential effects on the people who hear it, there is still the assumption that the talk they do engage in will be the expression of their knowledge. For example, Neis *et al.* state,

Comparing fishers’ maps of the physical environment with those of fish locations where there is conceivably less risk of information being withheld is also useful. Moreover, the level and extent of fishers’ organizational involvement may influence their *expression of ecological knowledge*, and so this information should also be collected (Neis *et al.*, 1999:223; our emphasis).

This assumption is also seen in guidelines for conducting interviews: “Before beginning the interview, put the informant at ease by making casual conversation and having tea together... Maintain a sense of humor and never contradict or argue with an informant” (Johnson and Ruttan, 1992: 54). In a similar vein, an inclination to keep secrets may be overcome because, once you have exchanged gifts with subjects, “you can be comfortable working with them and be sure you have their trust” (Kone, 1992:137). In addition to perhaps being naïve, this position still assumes that, once trust is gained, we can trust that what locals say is what they know.

We do, however, sometimes acknowledge that some talk may not be the expression of even inaccurate knowledge because of the possibility of “evasive responses” (Rhiannon and Cross, 1992:129) that may be due to the subjects’ “stake in the outcomes of the research process” (Gendron *et al.*, 2000:70). Gendron *et al.* suggest that we get around this potential problem by simply avoiding this particular kind of talk and only focusing on the talk that can be assumed to be the expression of knowledge. For example, they assert that

we could detect when a fisher could not or did not want to tell something. In the case of observations on lobster distribution, for instance, fishers would sometimes say that it was hard for them to tell clearly. A few fishers wanted to keep secret the organization of their gear (number of traps per line). Short and non-descriptive answers helped us to know that going further in that direction would lead to a dead end (Gendron *et al.*, 2000:70).

In contrast, when landings in a particular fishery were high and there was no other current monetary crisis, they state, “We believe that these elements helped us obtain reliable information. In addition, fishers expressed a cooperative interest in the survey and thus we trust the reliability of the information insofar as fishers could recall correctly”

(Gendron *et al.*, 2000:70). Unfortunately, a cooperative interest in a survey may stem from an interest in influencing others with LET instead of an interest in expressing knowledge.

The common observation that people say different, and even contradictory, things about the environment could lead to greater awareness that talk may not necessarily be the expression of knowledge, but often it is instead concluded to be evidence that people simply have different LEK. This then leads to the view that divergent statements about the environment are due to different amounts of knowledge or different degrees of accuracy in knowledge. For example, “[w]here localized knowledge is divergent or contradictory, it is critical to fully understand the social processes through which knowledge is produced. In other words, how do fishers come to believe what they do” (Felt, 1994:283). *It is crucial to recognize that the question of accuracy of what is said* (i.e., the degree to which what is said corresponds with the physical world) *is different from the question of whether what is said is the same as what people know*. All people probably have knowledge that is accurate (i.e., expectations about the physical world that correspond with the physical world) and knowledge that is inaccurate (i.e., expectations about the physical world that fail to correspond with the physical world), and distinguishing between these categories is obviously of fundamental importance to LEK researchers and humans in general (see Milton, 1996; Ingold, 1987). The point we wish to stress is that neither accurate environmental knowledge nor inaccurate environmental knowledge is necessarily equivalent to what people *say* about the environment. This point is missed in discussions about the accuracy of what is said when researchers continue to assume that what is said is what is known. For example, Neis (1992:166) emphasizes the importance of “teasing out the ‘truths’ in the local ecological knowledge.” Thus, “[w]hile evaluations of the reliability of a particular participant will depend in part on the judgment of the researcher, group reviews and other sources of local feedback can help minimize the role of the researcher in resolving conflicting statements from different participants” (Huntington, 2000:1271).

We agree that it is important to recognize that local people have different “levels of expertise” (Johnson and Ruttan, 1992:62), and “the accuracy and usefulness of the information obtained [from any interviewee] can be influenced by the interviewers’ knowledge and experience” (Gendron *et al.*, 2000:70). However, efforts to identify experts still rest on the assumption that both experts and non-experts express their knowledge when they talk, but that the knowledge expressed in the talk of experts is more likely to be accurate knowledge (i.e., more likely to correspond with ecological reality). In contrast, we suggest here the additional need of teasing out explicitly what local

people know about the environment, whether true or not, from what they say about the environment. All of the various methods used to identify experts (e.g., Rocha, 2005; Nadasday, 1999; Atran *et al.*, 2002) could benefit by keeping in mind an explicit distinction between LET and LEK.

Tip of the Iceberg: Current Awareness that LET is not Necessarily the Expression of LEK

Although there have been discussions of LET not always equaling LEK, they make up a very small part of the LEK literature. For example, Dahl (1989:57) realizes the possibility because “erroneous information published by a well-known ethnologist was apparently given to him as a joke,” but still asserts that “such weaknesses may be less apt to affect environmental information than other dimensions of traditional culture.” A few researchers have also pointed out that LET may not be LEK because LET may consist of “courtesy-bias errors” which “arise when respondents feel compelled to express only views they think the interviewer wants to hear” (Grenier, 1998:94). Johannes (1981) provides the most extensive discussion of this specific possibility, and of the general issue. He was warned “informants sometimes framed their answers to questions with a greater regard for pleasing the interviewer than for truth. Answers might be distorted to conform to the interviewer’s perceived opinions” (1981:8). He also points out the possibility of LET being “invented in cases where the real answer [to a question about the environment] was not known” (Johannes, 1981:8), but he is virtually alone in explicitly attempting to deal with these problems. His solution, possible only because he already knew a great deal about the local environment before interviewing local residents, was

to test the reliability of my informants by asking of them two types of questions....

First there were questions to which I already knew the answers. To such questions I almost always received either the correct answer or an admission of ignorance. Second were questions that I felt sounded plausible, but which I knew that the fisherman could not possibly answer. In virtually every instance when I asked this kind of question I received an immediate ‘I don’t know’ (Johannes, 1981:9).

Much to his surprise, Johannes reports only one respondent providing false information, and asks: “Why were things going so well?” (1981:8). He then reports that later

an anthropologist friend to whom I put this question came up with the probable explanation. It had to do with the difference between the kinds of questions I

was asking and those often asked by anthropologists. When a Pacific islander is asked about his eating habits, his kinship system, or his sexual customs, he is liable not to see the point of the question...

In contrast, the fishermen could easily perceive the purposes of most of my questions. My interests were similar to theirs [and they wanted it recorded correctly before it disappears] (Johannes, 1981:8).

It was unfortunate for the future of LEK research that only one interviewee failed Johannes’s test, leading him to conclude that statements about environmental issues are not likely to be subject to socio-political influences. One of the reasons that we cannot be confident that LET is always synonymous with LEK is that talk about the environment is often highly political. Indeed, the explosion in work on political ecology in recent decades is part of this realization that discursive as well as material conflicts over natural resources are fundamental to human relations (Robbins, 2004; Latour, 2004). Further, while Johannes’ methods may work in many cases (see Neis *et al.*, 1999), they will often not be possible in many of the situations where LEK is most important. This is because these methods cannot be used whenever researchers are trying to learn from local people what they themselves do not already know, which is after all the point of LEK research.

Part of the reason that the implications of LET not necessarily being LEK have not been fully appreciated may be the different scales of political ecology and LEK studies. Political ecologists have tended to focus on the level of competition and conflict between indigenous peoples and dominant, often external, societies. For example, when discussing the politicized communication between “managers and the managed,” Roepstorff (2000:166) goes so far as to say, “although knowledge is potentially about reality, it is so infected with power and position that the discourse becomes just another way to disempower the weak.” However, while the political dimension of macro-level ecological studies has been a central focus, the political dimension of micro-level discourse about the environment, that usually forms the subject matter of studies of LEK, has only received limited attention.

Discussions of the importance of micro-level politics influencing LET include Grenier’s (1998:33–34) observation that “[t]he quality and quantity of the information generated by a group over a given period of time will be affected by such factors as size; group composition and psychological state; and social, economic, and cultural factors.” Similarly, Fischer (2000:42) points out that “caution is advised when dealing with this kind of information; a thorough appraisal of the interests of fishing people and related risks to the provision of reliable

information should be performed before data are taken.” Neis *et al.* (1999:223) point out that, in some situations, the relationships among local people can also influence what is said about the environment:

In politicized contexts it is also important to consider the organizational identification of the researchers (i.e., are they associated with an organization considered by many to be “opposed” to fishers’ interests?) and the risks of conducting interviews in a group context. Fishers may be more honest if they are interviewed alone, and observations of group discussions can provide an impression of the impact that public conflict may be having on “stated views.”

Neis and Morris (2002:230) also point out that the oral transmission of knowledge can be “mediated by competition,” but fail to elaborate on what this entails (see also Haenn, 2002; Hostettler, 2002).

The influence of local micro-level politics on LET is ubiquitous and warrants far greater attention, and the explicit study of LES—local ecological skepticism—can be used as a way of partially dealing with this situation. Skeptical statements made by local people about “scientific” knowledge are often recorded in LEK studies (e.g., Neis, 1992:157), but lesser attention has been given to *skeptical statements by local people about what other local people say about the environment* (i.e., LES). What scattered reports of LES exist in the literature do little more than suggest that LES varies from culture to culture. Some researchers report that LES is a common and expected part of conversations about the environment (Blurton Jones and Konner, 1989). In contrast, Gunn *et al.* (1988:25) report that “Inuit hunters rarely question observations related by others and do not always ascribe more importance to multiple than single observations.” In fact, they state that “the questioning of observations [is] normal for a scientist but rude for a hunter. There are, of course, other examples of differing social graces or attitudes that are relevant to communicating between cultures (e.g., Black, 1973; Darnell, 1981).” As a contribution to this literature, we will now describe both the traditional cultural speech styles and politically based LES in the study area of the Northern Peninsula of Newfoundland, and show how both of these factors provide reasons for questioning the fundamental assumption that LET can be safely assumed to be LEK.

The Newfoundland Case Study

The Great Northern Peninsula of Newfoundland (GNP) was once home to the Beothuck, and other aboriginal populations. It was also visited briefly by the Norse and used as a fishing area by the French before being populated by the

British ancestors of current residents in the late eighteenth and early nineteenth centuries. Since that time it has been a relatively isolated area relying primarily on marine resources (especially cod) and secondarily on lumber and mining. Many of the traditional patterns of culture and social interaction are based on this ecological adaptation of domestic commodity fishing in an island environment (Palmer, 1995; Palmer and Sinclair, 1997). The semi-isolation of this area helped maintain distinctive traditional patterns of fixed gear fishing techniques, land inheritance, and other activities into the 1960s (Firestone, 1967).

Traditional patterns of fishing started to change with the introduction of new fish harvesting technology, particularly the use of draggers by a minority of the population during the 1960s and 1970s. Further changes occurred with the decline in cod harvests in the late 1980s, at least partially due to overfishing, and the subsequent moratorium on cod harvesting in 1994 (Felt and Sinclair, 1995; Palmer, 2003). The official closure of the commercial cod fishery in 1994 caused intensified competition for resources, especially among the dragger fleet because it now had to rely on various alternative species such as shrimp. Today the region includes several dozen villages with populations of several hundred people or less in addition to the slightly larger communities of Port au Choix and St. Anthony. Although some fixed gear and dragger fishers have managed to survive, the area has experienced significant out-migration due to collapse of the cod fishery (Palmer and Sinclair, 2000; Palmer, 2003). Many of the remaining residents have turned to tourism to earn a living (Fife, 2002; 2004a, b). Much of the difference between LET and LEK among residents of this area is a combination of traditional styles of social interaction and this general socio-political context of technological changes resulting in increased social stratification and depletion of marine resources over the last several decades.

Traditional Newfoundland Styles of Speech

The large amount of ethnographic fieldwork performed in Newfoundland during the 1960s and 1970s focused largely on the complex and subtle aspects of traditional Newfoundland social interaction. This was perhaps best exemplified by the great interest in the complex and paradoxical ritual of “mumming” (also known as “mummering” or “Janneying”) where local residents would dress so as to disguise their identity, and then visit a household in the community where they would engage in ritualized mock violence until the residents correctly identified their identities (Firestone, 1978; Palmer, 1992; Palmer and Pomianek, *in press*). Although not explicitly related to environmental knowledge, mumming serves as a potent reminder that human communication is far more complex than the simple

assumption that talk is the expression of knowledge. With this in mind, we turn to some of the traditional forms of verbal interaction on the GNP and other areas of Newfoundland directly related to the relationship between LEK and LET.

Felt points out that on the GNP there is a traditional reticence about talking about one's knowledge, and that "[n]ot to understand this runs the risk of confusing cultural rhetoric with ignorance" (Felt, 1994:261). Local residents are also traditionally reluctant to disagree with what other people, locals and researchers, say about the environment. Firestone states that "[i]ndividuals tend to agree with direct statements as a matter of course, and an attitude of consensus is most often overtly maintained—even though it is sure that this is not the case in actuality" (Firestone, 1967:119). This traditional manner of verbal interaction is particularly significant for researchers assuming that LET is LEK when there is consensus (Nadasday, 1999; Atran *et al.*, 2002). Similarly Chiaramonte (1970:15) reports that "throughout the monologues [about the environmental factors encountered on a hunting trip], no one would comment on what another said, even if one of the men in the group had been on the same hunting trip and knew the description was faulty. He might, however, speak to one of the listeners at another time, and voice his criticisms of the account."

Faris (1966:241) points out additional traditional styles of speech that are gender specific. While women engage in "gossip," men exchange "news." While the potential discrepancy between gossip and knowledge is obvious, the same may be true of "news" about the environment. In regard to seal hunters and furriers during the 1830s, Faris quotes Jukes' (1842) observation that "[i]t seems to be a stain on a man's character if on coming into a harbour he has not a budget of news; so that if he knows none, he immediately draws upon his imagination," and then states that the same observation could be made at the time of his research in the 1960s. The full importance of this observation is made clear by Faris (1966:237): "there is very little verbal exchange save 'gossip' and 'news.' Learning [including learning about how to earn a living from the environment] in Cat Harbour is largely by way of observation, not conversation."

Perhaps the most elaborate traditional Newfoundland form of speech is the "cuffer." Faris (1966:244) explains that to tell a cuffer is to "Introduce some exaggeration or twist to an item of history or contemporary event in order to keep the conversation going." For example, "[h]umor is frequently used, as are 'cuffers,' or exaggerated stories told in competition with other fishers. As an example, [there is] the cuffer about setting fish nets anchored to icebergs, an unlikely practice" (Berkes, 1999:45–46; citing Felt, 1994:259). As Sider (1985; 2003) has discussed, cuffers are complex forms of interaction that may be related to

power relations within Newfoundland society. Cuffers are particularly important here because they often consist of exactly the type of LET so widely assumed to be LEK. For example, Sider (1986:163) writes that cuffers are often about the environment, for example "the bounteous catches of fish and seals."

LES and the Socio-political Environment of Newfoundland

It is crucial to realize that in Newfoundland all of these traditional forms of speech frequently mix with political reasons for LET to differ from LEK. Many of these political reasons are understandable only with the general understanding of the changing socio-political context of the area provided above. The development of social stratification between draggers and fixed gear fishers followed by the collapse of the cod stocks and the blame for the collapse attributed to draggers by fixed gear fishers, has produced a situation where nearly all talk about the environment is politicized. Further, the realization of this fact by local residents means that LES is a pervasive part of LET. For example, during one interview with Palmer in 1990, an interviewee stated: "The big problem is dishonesty—no one ever tells the truth about what they know, what they do, and why they do things in the fishery."

Several specific examples of LET and LES about the local environment recorded over the past 15 years of fieldwork in the area will illustrate our central argument. These statements are from various structured and semi-structured interviews and participant observation by Palmer between 1990 and 2005.

Does Cod Spawn During Winter Fishery?

As described above, the draggers in general are highly controversial because of the view they have destroyed the cod stocks. During the 1980s and early 1990s, the draggers' winter fishery off the southwest corner of Newfoundland was a particularly frequent object of criticism because the draggers caught a great deal of cod in this fishery. Often the winter fishery was also criticized by fixed gear fishers for being particularly ecologically disastrous, because it was asserted to disrupt the spawning of cod. During the early 1990s, the LET of fixed gear fishers concerning this issue consisted of such statements as:

Yes [the cod spawns during the winter fishery]. They [dragger fishers] had to shovel the spawn off the decks.... And at the same time then, the deputy minister in Ottawa comes out and says we got no scientific evidence to suggest that [cod spawns during the winter fishery]....You know, that's a pretty stupid remark (fixed gear fisher, 1990).

Not surprisingly, dragger fishers responded to this kind of LET by fixed gear fishers by engaging in LES that often included the assertion that fixed gear fishers had a political motive behind their LET:

All I know is I've never seen spawn in the winter. That's just something the fixed gear fishermen came up with to blame the draggers [for the decline in the cod stocks] (dragger fisher, 1990).

Are Seals to Blame?

Throughout the last 15 years, another highly politicized subject of LET has been the role of harp seals in the depletion of the cod stocks. This LET usually takes the form of asserting that the cessation of the large scale seal hunts due to international protests during the 1970s (Patey, 1990) led to a huge increase in the number of harp seals during the time that the cod stocks declined. When this argument is combined with the assumption that seals are major predators of cod, an increasing number of seals became a possible cause of the decline of cod. Thus, the decline of the cod stocks can be blamed on an increased number of seals instead of overfishing by the draggers.

In regard to the number of seals, the LET of many fixed gear fishers is that seals are *not* more plentiful now than they were in the past when cod was abundant. For example, in response to this question one fixed gear fisher stated: "No, you don't see seals now, not like in the old days" (fixed gear fisher, 1991). Then, in agreement with this answer, a second fixed gear fisher said, "Yes boy, the seals [in the old days], well my son, you used to have to push seals out of your way just to get to your cod trap." This LET is an example of a combination of current political concerns and traditional cuffer-like exaggeration.

The LET of fixed gear fishers also often includes LES about assertions that seals are a major predator of cod: "Now the draggers, they'll tell you it's the seals destroying the cod, but I heard the scientists say seals don't eat much [cod]" (fixed gear fisher, 1991). In some cases, such as this answer to the question of whether or not seals have caused the cod stocks to decline, this LET and LES again takes on a cuffer-like form:

No, you hear this stuff about the seals eating the cod and all this you know but [it is] political bull as far as I'm concerned. When John Cabot came over, a little over five hundred years ago, according to my information that I got, there was cod then. He had a job to get into shore they say... The boat going on the cod. Now, that's the story.... And I haven't heard anyone say that there was no seals at that time.... To blame seals for the

destruction in the cod stock is nothing more than political bull (fixed gear fisher, 1991).

Such statements are in stark contrast to the LET of many dragger fishers when describing the diet of seals: "Well my son, they don't eat turnips!" (dragger fisher, 1991). The LET of dragger fishers on this topic would also include LES about the LET of fixed gear fishers: "Well, I can tell you what most people are telling you [about what destroyed the fishery]: the draggers. But it's actually... [the] seals and whales that have reduced the stock. We need to educate people that it's not just the draggers" (dragger fisher, 1992).

Are Shrimp Small?

The above examples of both LET and LES could be anticipated by anyone knowing only the general outline and history of the socio-political conflict between dragger fishers and fixed gear fishers in the area. However, an understanding of other LET requires a detailed knowledge of the local socio-political context. Although the categories of dragger fisher and fixed gear fisher formed a large part of the cultural identity of Newfoundland fishers during the study period, there were many other aspects of cultural identity that influenced what any given individual might say about the environment in a certain situation. In addition to the typical socio-cultural variables of age, gender, class and religion, fishery related divisions within the categories of dragger fisher and fixed gear fisher were also of paramount importance in some cases.

In the following example, despite several years of participant observation in the fishery, Palmer had to have the reason for LES explained to him. As previously mentioned, the closure of the cod fishery in 1994 meant most dragger fishers had to rely on the shrimp fishery (see Palmer and Sinclair, 1996; Palmer and Sinclair, 2002). When they brought their first catches of shrimp to the processing plants, many dragger fishers were very distraught to hear that the shrimp were too small and that the shrimp fishery would have to be delayed until larger shrimp was brought in. There were even rumors that the shrimp fishery for that year would be cancelled all together.

There was considerable variation in the LET concerning the size of shrimp. Several female fish plant workers told the senior author that the shrimp were indeed unusually small: "Small, well my dear, sea lice! That's what I call 'em" (fish plant worker, 1994). Fish plant workers also engaged in LES about the LET of some dragger fishers: "The sensible fishermen say it's small, but others say it's not" (fish plant worker, 1994). Some fish plant workers also suggested that Palmer should engage in LES if, in the future, he heard fish plant workers saying that the shrimp

was no longer small: “Well [a certain fish plant worker] is in trouble with [her boss] for saying this catch is just a little bigger than the first batch. Since [her boss] wants them to go fishing he wants her to say the shrimp was huge!” (fish plant worker, 1994)

The most interesting pattern of LET concerned conflicting statements by the dragger fishers from different areas of the coast—the area around Port au Choix, and the communities along the Strait of Belle Isle. The LET of dragger fishers from Port au Choix tended to be similar to the LET of fish plant workers: “Yes, its small, the smallest I’ve ever seen!” (Port au Choix dragger, 1994). However, the LET of dragger fishers from the Strait of Belle Isle was very different:

I heard the shrimp was small but the ones we brought home seem normal (Strait of Belle Isle dragger fisher, 1994).

The shrimp is not that much smaller than normal (Strait of Belle Isle dragger fisher, 1994).

Well, it was small last year [and they still bought it] (Strait of Belle Isle dragger fisher, 1994).

When Palmer asked a dragger skipper from the Strait of Belle Isle why the LET of dragger fishers from his area was so different from the LET of the dragger fishers from Port au Choix, the dragger fisher provided an answer that illustrates the potential complexity of LET, LEK and LES:

The Port au Choix boats are mainly paid off, see? Therefore, they want to force the other shrimpers out of business by messing up the shrimp fishery. That’s why they are the ones saying the shrimp are small... and the government, they want that too, so they go along (Strait of Belle Isle, dragger fisher).

Such internal divisions within the dragger fisher and fixed gear fisher categories also influenced LET regarding other fishery issues such as the need for the closure of the fishery in the early 1990s and the overall state of the cod stocks (see Palmer and Sinclair, 1997).

The importance of using LES to help distinguish LET from LEK might be limited if LES was restricted to verbal interactions in informal settings and interviews on topics broader than LEK *per se* like the above examples, and thus absent from formal interviews focused explicitly on LEK. Not only was that not the case in Newfoundland, there was almost a ritualized reference to the possibility that LET would not be equivalent to LEK in formal interviews. The following quotes are typical:

So do you want me to separate out the truth from the lies? (dragger fisher, 1990)

Now that the interview is over I can stop telling lies. (retired fixed gear fisher, 2000)

So what are the rest of them telling you? (dragger fisher, 1994)

Well now I know what others been telling you, but I’m going to tell you the truth. (fixed gear fisher, 1990)

I’m not going to say anything about cod because I don’t want to say anything to make anybody mad. (fixed gear fisher, 1990)

I knows that [what ruined the fishery], but I run a small business, see? So I can’t say what I knows. (ex-fixed gear fisher, 2005)

Now I knows just what my husband knows, so what did he say? (wife of ex-fixed gear fisher, 2005)

These quotes suggest that using LES to help distinguish LET from LEK is just as important in formal interviews explicitly concerning LEK as it is in more informal observations.

Finally, as the examples provided above illustrate, there are many reasons for LES. Much of the LES in the previous examples is based on the assumption by local people that other local people will be motivated by economic self-interest when talking about the environment. Other reasons for LES include assumptions about personality characteristics of certain individuals (i.e., individuals who are not “sensible”) and the assumption that an individual lacks the necessary experience with the aspect of the environment under discussion (e.g., the abundance of seals). Perhaps the most interesting reason for LES is the view that LET based upon the statements of scientists is suspect because scientists are assumed to be either untrustworthy or lacking in knowledge (e.g., scientists make “stupid” remarks). In the study area, much of this skepticism of local people toward the statements of fishery scientists is due to fishers feeling that their own knowledge has been “neglected” by scientists in the past (Neis and Kean, 2003:69). Attempting to correct this situation is one of the reasons for the abundance of recent LEK research in Newfoundland. Thus, the statements of LEK researchers, both in their interviews with local residents and in their scientific writings, must also be seen as LET that takes place within a complex socio-political environment.

Conclusion

We fully recognize that we are not the first to raise the points stressed in this paper. Fischer (2000:42), for example, has also called for “a thorough appraisal of the interests of fishing people and related risks to the provision of reliable information should be performed before data are taken.” Our position is also consistent with the more general position that there has been “too much emphasis on an approach that privileges linguistic means of knowing and ordering, even to

the point of considering them the only ones. Thus, naturalistic knowledge seems to be overly reduced to the operations of naming, classifying, and categorizing” (Angioni, 2004:243). We also agree that, in addition to studying LES and using it to distinguish LET from LEK, it is important to focus on non-verbal behavior as an indication of knowledge. Palsson (2000:30) illustrates this point nicely by stressing that successful navigation requires more perceptions than could possibly be put into words.

However, we argue that these points, and their implications for the study of LEK, have not been fully appreciated. Instead, the difference between LET and LEK has been little more than a footnote in the overall literature on LEK. Indeed, our main point is essentially summed up in a footnote by Faris (1966). In regard to his description of the chronic inaccuracy of “news” in Newfoundland communities, he footnotes that “there is always room for more speculation [about the environment]—which of course, may be preferred to the ‘facts’... Government officials introducing programs in the outport should keep this in mind.” (Faris, 1966:242)

This does not mean that researchers should ignore what is said by local residents regarding their environment. It only means that the study of LEK should “focus on persons in lived situations, rather than discourse” (Wikan, 1992:460) removed from the sociopolitical context of human existence. That is, the study of LEK should take into consideration the entire knowledge of local people, the social dimensions of which are much deeper and more complex than is assumed when researchers merely record LET as the expression of LEK. This complex view of the environmental *and social* knowledge possessed by all humans is exemplified nicely by Gerald Sider’s caption for a photo of a Newfoundland “mummer”:

A Newfoundland mummer... A village fisherman who is famous for the number of songs he knows.... When folklorists come to record him, he always leaves a verse or two out of each song for the songs are his, and a part of who he is. He is a good fisherman, an exceptional hunter, and an extraordinary master of local wisdom, who husbands his skills carefully, choosing whom to take hunting and how he uses his knowledge (Sider, 2003:179).

References

- Andersen R. (1973). Those Fishermen Lies: Custom and Competition in North Atlantic Fishermen Communication. *Ethos* 38(1): 153–164.
- Angioni G. (2004). Doing, thinking, saying. In Sanga, C. and Gherardo, O. (eds.), *Nature Knowledge: Ethnoscience, Cognition, and Utility*, Berghahn Books, New York, pp. 243–248.
- Atran S., Medin D., Ross N., Lynch E., Vapnarsky V., Ucan Ek’ E., Coley J., Timura C., and Baran M. (2002). Folkecology, Cultural Epidemiology, and the Spirit of the Commons: A Garden Experiment in the Maya Lowlands, 1991–2001. *Current Anthropology* 43(3): 421–441.
- Baines G. (1992). Traditional environmental knowledge from the Marovo area of the Solomon Islands. In Johnson, M. (ed), *Lore: Capturing Traditional Environmental Knowledge*, Dene Cultural Institute, Hay River, NWT, pp. 91–110.
- Berkes F. (1999). *Sacred Ecology: Traditional Ecological Knowledge and Resource Management*. Taylor and Francis, Philadelphia.
- Black M. (1973). Ojibwa Questioning Etiquette and Use of Ambiguity. *Studies in Linguistics* 23: 13–29.
- Blurton Jones N., and Konner, M. J. (1989). Kung knowledge of animal behaviour. In Johannes, R. E. (ed.), *Traditional Ecological Knowledge: A Collection of Essays*, IUCN, Gland, Switzerland, pp. 21–29.
- Chiaramonte L. (1970). *Craftsman–Client Contracts: Interpersonal Relations in a Newfoundland Fishing Community*. ISER, St. John’s, Newfoundland.
- Cronk L. (1994). Evolutionary Theories of Morality and the Manipulative use of Signals. *Zygon* 29: 32–58.
- Dahl A. L. (1989). Traditional environmental knowledge and resource management in New Caledonia. In Johannes, R. E. (ed.), *Ecological Knowledge: A Collection of Essays*, IUCN, Gland, Switzerland, pp. 57–66.
- Darnell R. (1981). Taciturnity in Native American Etiquette: A Cree Case. *Culture* 1(2): 55–60.
- Faris J. (1966). *Cat Harbour: A Newfoundland Fishing Settlement*. ISER, St. John’s, Newfoundland.
- Felt L. F. (1994). Two tales of a fish: The social construction of indigenous knowledge among Atlantic Canadian salmon fishers. In Dyer, C. L. and McGoodwin, J. R. (eds.), *Folk Management in the World’s Fisheries: Lessons for Modern Fisheries Management*, University Press of Colorado, Boulder, CO, pp. 251–286.
- Felt L. F., and Sinclair P. R. (eds.) (1995). *Living on the Edge: The Great Northern Peninsula of Newfoundland*. ISER: St. John’s, Newfoundland.
- Fife W. (2002). Performing history: Vikings and the creation of a tourism industry on the GNP of Newfoundland. In Roseman, S. R. (ed.), *Identities, Power, and Place on the Atlantic Borders of Two Continents: Proceedings from the International Research Linkages Workshop on Newfoundland and Labrador Studies and Galician Studies*, Memorial University of Newfoundland, St. John’s, Newfoundland, pp. 51–62.
- Fife W. (2004a). Semantic Slippage as a New Aspect of Authenticity: Viking Tourism on the Northern Peninsula of Newfoundland. *Journal of Folklore Research* 41(1): 61–84.
- Fife W. (2004b). Penetrating Types: Conflating Modernist and Post-modernist Tourism on the Great Northern Peninsula of Newfoundland. *Journal of American Folklore* 117(464): 147–167.
- Firestone M. (1967). *Brothers and Rivals: Patrilocality in Savage Cove*. ISER, St. John’s, Newfoundland.
- Firestone M. (1978). Christmas Mummings and Symbolic Interactionism. *Ethos* 6(2): 92–113.
- Fischer J. (2000). Participatory research in ecological fieldwork: A Nicaraguan study. In Neis, B. and Felt, L. (eds.), *Finding Our Sea Legs: Linking Fishery People and Their Knowledge with Science and Management*, ISER, St. John’s, Newfoundland, pp. 41–54.
- Fleming M. (1992). Reindeer management in Canada’s Belcher Islands: Documenting and using traditional environmental knowledge. In Johnson, M. (ed.), *Lore: Capturing Traditional Environmental Knowledge*, Dene Cultural Institute, Hay River, NWT, pp. 69–87.
- Flinn M., Geary D., and Ward, C. (2005). Ecological Dominance, Social Competition, and Coalitionary Arm Races: Why Humans

- Evolved Extraordinary Intelligence. *Evolution and Human Behavior* 26: 10–46.
- Gendron L., Camirand R., and Archambault, J. (2000). Knowledge-sharing between fishers and scientists: Towards a better understanding of the status of lobster stocks in the Magdalen Islands. In Neis, B. and Felt, L. (eds.), *Finding our Sea Legs: Linking Fishery People and Their Knowledge with Science and Management*, ISER, St. John's, Newfoundland, pp. 56–71.
- Greaves T. (1989). Tribal rights. In Johannes, R. E. (ed.), *Traditional Ecological Knowledge: A Collection of Essays*, IUCN, Gland, Switzerland, pp. 25–40.
- Grenier L. (1998). *Working with Indigenous Knowledge: A Guide for Researchers*. International Development Research Centre, Ottawa.
- Gunn A., Arlooktoo G., and Kaomayok, D. (1988). The contribution of the ecological knowledge of Inuit to Wildlife management in the Northwest Territories. In Freeman, M. and Carby, L. N. (eds.), *Traditional Knowledge and Renewable Resource Management in Northern Regions*, Canadian Circumpolar Institute, Edmonton, Alberta, pp. 22–29.
- Haenn N. (2002). Commentary. *Current Anthropology* 43(3): 442–443.
- Harre R., Brockmeier J., and Mulhauser, P. (1998). *Greenspeak: A Study of Environmental Discourse*. Sage, New York.
- Hayward T. (1998). *Political Theory and Ecological Values*. St. Martin's Press, New York.
- Hostettler U. (2002). Commentary. *Current Anthropology* 43(3): 444–445.
- Hunn E. (1993). What is traditional ecological knowledge? In Williams, N. and Baines, G. (eds.), *Traditional Ecological Knowledge: Wisdom for Sustainable Development*, Centre for Resource and Environmental Studies, Australian National University, Canberra, pp. 13–15.
- Huntington H. P. (2000). Using Traditional Ecological Knowledge in Science: Methods and Applications. *Ecological Applications* 10(5): 1270–1274.
- Ingold T. (1987). *The Appropriation of Nature: Essays on Human Ecology and Social Relations*. University of Iowa Press, Iowa City, IA.
- Johannes R. (1981). *Words of the Lagoon: Fishing and Marine Lore in the Palau District of Micronesia*. University of California Press, Berkeley, CA.
- Johnson M. (ed.) (1992). *Lore: Capturing Traditional Environmental Knowledge*. Dene Cultural Institute, Hay River, NWT.
- Johnson M., and Ruttan R. (1992). Traditional environmental knowledge of the Dene: A pilot project. In Johnson, M. (ed.), *Lore: Capturing Traditional Environmental Knowledge*, Dene Cultural Institute, Hay River, NWT, pp. 35–63.
- Jukes J. B. (1842). *Excursions in and About Newfoundland During the Years 1839 and 1840, 2 Volumes*. J. Murray, London.
- Kone B. (1992). An experience in oral history: One research's account. In Johnson, M. (ed.), *Lore: Capturing Traditional Environmental Knowledge*, Dene Cultural Institute, Hay River, NWT, pp. 136–144.
- Latour B. (2004). *Politics of Nature: How to Bring the Sciences into Democracy*. (translated by Catherine Porter) Harvard University Press, Cambridge, MA.
- Lenton L. M., and Short J. E. (2000). *Environmental Discourse and Practice: A Reader*. Blackwell, Malden, MA.
- Maurstad A. (2000). Trapped in Biology: An interdisciplinary attempt to integrate fish harvesters' knowledge into Norwegian fisheries management. In Neis, B. and Felt, L. (eds.), *Finding Our Sea Legs: Linking Fishery People and Their Knowledge with Science and Management*, ISER, St. John's, Newfoundland, pp. 135–152.
- McDonald M., Arragutainaq L., and Novalinga, Z. (1997). *Voices from the Bay: Traditional Ecological Knowledge of Inuit and Cree in the Hudson Bay Bioregion*. Canadian Arctic Resources Committee, Environmental Committee of Municipality of Sanikiluaq, Ottawa.
- McGoodwin J. R., and Dyer C. L. (eds.) (1994). *Folk Management in the World's Fisheries: Lessons for Modern Fisheries Management*. University Press of Colorado, Boulder, CO.
- Milton K. (1996). *Environmentalism and Cultural Theory: Exploring the Role of Anthropology in Environmental Discourse*. Routledge, New York.
- Nadasday P. (1999). The Politics of TEK: Power and the 'Integration' of Knowledge. *Arctic Anthropology* 36: 1–18.
- Neis B. (1992). Fishers' Ecological Knowledge and Stock Assessment in Newfoundland. *Newfoundland Studies* 8(2): 155–178.
- Neis B. and Kean R. (2003). Why fish stocks collapse: An interdisciplinary approach to the problem of "fishing up." In Byron, R. (ed.), *Retrenchment and Regeneration in Rural Newfoundland*, University of Toronto Press, Toronto, pp. 65–102.
- Neis B., and Morris M. (2002). Fishers' ecological knowledge and fisheries science: The capelin fishery, 1975–1996. In Ommer, R. (ed.), *The Resilient Outport: Ecology, Economy, and Society in Rural Newfoundland*, ISER, St. John's, Newfoundland, pp. 205–240.
- Neis B., Felt L., Haedrich R. L., and Schneider D. C. (1999). An interdisciplinary method for collecting and integrating fisher's ecological knowledge into resource management. In Newell, D. and Ommer, R. E. (eds.), *Fishing Places, Fishing People: Traditions and Issues in Canadian Small-scale Fisheries*, University of Toronto Press, Toronto, pp. 217–238.
- Newell D., and Ommer R. E. (eds.) (1999). *Fishing Places, Fishing People: Traditions and Issues in Canadian Small-Scale Fisheries*. University of Toronto Press, Toronto.
- Palmer C. T. (1990a). Telling the Truth (Up to a Point): Radio Communication Among Maine Lobstermen. *Human Organization* 49(2): 157–163.
- Palmer C. T. (1990b). Balancing Competition and Cooperation: Verbal Etiquette Among Maine Lobstermen. *Maritime Anthropological Studies* 3(1): 87–105.
- Palmer C. T. (1991a). Organizing the Coast: Information and Misinformation During the Maine Lobstermen's Tie-up of 1989. *Human Organization* 50(2): 194–202.
- Palmer C. T. (1991b). Kin-selection, Reciprocal Altruism and Information Sharing Among Maine Lobstermen. *Ethology and Sociobiology* 12(3): 221–236.
- Palmer C. T. (1992). Mummies and Real Strangers: The Impact of Diminished Isolation on Christmas House Visiting in Rural Newfoundland. *Newfoundland Studies* 8(2): 125–134.
- Palmer C. T. (1993a). Folk Management, 'Soft Evolutionism' and Fishers' Motives: Implications for the Regulation of the Lobster Fisheries of Maine and Newfoundland. *Human Organization* 52(4): 414–420.
- Palmer C. T. (1993b). When to Bear False Witness: An Evolutionary Approach to the Social Context of Honesty and Deceit Among Commercial Fishers. *Zygon: Journal of Religion and Science* 28(4): 455–468.
- Palmer C. T. (1995). Growing female roots in patrilineal soil: Cod traps, fishplants, and changing attitudes towards women's property rights. In Sinclair, P. R. and Felt T. (eds.), *Living on the Edge: The Great Northern Peninsula of Newfoundland*, Institute of Social and Economic Research, St. John's, Newfoundland, pp. 150–163.
- Palmer C. T. (2003). A decade of uncertainty and tenacity in northwest Newfoundland. In Byron, R. (ed.), *Retrenchment and Regeneration in Rural Newfoundland*, University of Toronto Press, Toronto, pp. 43–64.
- Palmer C. T., and Pomianek C. (in press). Applying Signaling Theory to Traditional Cultural Rituals: The Example of Newfoundland Mummung. *Human Nature*.

- Palmer C. T., and Sinclair P. R. (1996). Perceptions of a Fishery in Crisis: The Attitudes of Dragger Skippers Towards the Gulf of St. Lawrence Cod Moratorium. *Society and Natural Resources* 9(3): 267–279.
- Palmer C. T., and Sinclair P. R. (1997). *When The Fish Are Gone: Ecological Disaster and Fishers in Northwest Newfoundland*. Fernwood, Halifax, Nova Scotia.
- Palmer C. T., and Sinclair P. R. (2000). Expecting to Leave: Attitudes to Migration Among High School Students on the Great Northern Peninsula of Newfoundland. *Newfoundland Studies* 16(1): 30–46.
- Palmer C. T., and Sinclair P. R. (2002). Whose knowledge is local knowledge? Dragger skippers' perceptions of the fishery in Northwest Newfoundland. In Roseman, S. R. (ed.), *Identities, Power, and Place on the Atlantic Borders of Two Continents: Proceedings from the International Research Linkages Workshop on Newfoundland and Labrador Studies and Galician Studies*, Memorial University of Newfoundland, St. John's, Newfoundland, pp. 113–126.
- Palsson G. (2000). Finding one's sea legs: Learning, the process of enskillment, and integrating fishers and their knowledge into fisheries science and management. In Neis, B. and Felt, L. (eds.), *Finding Our Sea Legs: Linking Fishery People and Their Knowledge with Science and Management*, ISER, St. John's, Newfoundland, pp. 26–40.
- Patey F. (1990). *A Battle Lost: An Unsuccessful Attempt to Save the Seal Hunt*. Bebb, St. Anthony, NFLD.
- Power N. G. (2000). Women processing workers as knowledgeable resource users: Connecting Gender, local knowledge, and development in the Newfoundland fishery. In Neis, B. and Felt, L. (eds.), *Finding Our Sea Legs: Linking Fishery People and Their Knowledge with Science and Management*, ISER, St. John's, Newfoundland, pp. 189–203.
- Rhiannon B., and Cross N. (1992). Documenting Oral History in the African Sahel. In Johnson, M. (ed.), *Lore: Capturing Traditional Environmental Knowledge*, Dene Cultural Institute, Hay River, NWT, pp. 113–135.
- Robbins P. (2000). The Practical Politics of Knowing: State Environmental Knowledge and Local Political Economy. *Economic Geography* 76(2): 126–144.
- Robbins P. (2004). *Political Ecology: A Critical Introduction*. Blackwell, Malden, MA.
- Rocha J. M. (2005). Measuring Traditional Agro-ecological Knowledge: An Example from Peasants in the Peruvian Andes. *Field Methods* 17(4): 356–372.
- Roepstorff A. (2000). The double interface of environmental knowledge: Fishing for Greenland Halibut. In Neis, B. and Felt, L. (eds.), *Finding Our Sea Legs: Linking Fishery People and Their Knowledge with Science and Management*, ISER, St. John's, Newfoundland, pp. 165–188.
- Sider G. (1986). *Culture and Class in Anthropology and History: A Newfoundland Illustration*. Cambridge University Press, Cambridge.
- Sider G. (2003). *Between History and Tomorrow: Making and Breaking Everyday Life in Rural Newfoundland*. Broadview, Toronto.
- Sillitoe P. (1998). The Development of Indigenous Knowledge: A New Applied Anthropology. *Current Anthropology* 39(2): 223–235.
- Wikan U. (1992). Beyond the Words: The Power of Resonance. *American Ethnologist* 19(3): 460–482.
- Yearly S. (1996). *Sociology, Environmentalism, Globalization*. Sage, New York.