Applied Environmental Education and Communication, 4:353–361, 2005

ISSN: 1533-015X print / 1533-0389 online
DOI: 10.1080/15330150500302221

Routledge
Taylor & Francis Group

An Emic Approach to Distinguishing Facts from Values

Courtland L. Smith, *Department of Anthropology, Oregon State University, Corvallis, Oregon, USA*

In the presentation of scientific information, we assume that people can distinguish between facts and values. An experiment with four populations of students shows they can emically identify factual statements from ones judged to be statements of values. The emic definition of facts is based on judgments by members of the study population. On a population basis, clear distinctions were made between factual and value statements. The students own values toward environmental considerations and their experience studying ecological issues are correlated with the identification of factual statements. Values statements tend to have stronger language, while factual ones have more qualifiers.

Communicating scientific information is a complex process where ethical and value judgments become mixed with facts. Separating facts from values is critical to the policy process, informing the public, advancing scientific understanding, and making decisions. How facts and values influence peoples' knowledge and action is critical to resolving public policy issues. As a general rule, we tend to assume that people can distinguish between factual and value-oriented statements.

The Oregon Chapter of the American Fisheries Society suggests that when presenting professional judgments "opinions—clearly so identified—have value, but must not be put forward as fact" (Friedman, 2003, p. 1). Values are social norms having to do with right and wrong, good and bad. Ethics lay ". . . out rules and ideals as to what is expected of persons" (AAA, 2004). Rules and ideals are expressed in values. Anthropologists have defined values as "when we judge something as good or bad . . ." (Gross, 1992, p. 40) or "what is desirable in human experience" (Spradley & McCurdy, 2000, p. 6). Sentences including verbs like "should," "ought," and "must" connote a value statement to readers. The study of values is an interest of the social sciences. Anthropology, sociology, social psychology, all have perspectives on values. The perspective used in this analysis comes more from anthropology and sociology (Kempton et al., 1995; Biersack, 1999; Kottak, 1999; Culhane, 2001). Further, the perspective takes the view that members of a community come to define what are accepted as facts. This is a different perspective on facts than is common to ecological and biological sciences.

Taking an anthropological perspective, the identification of facts can be viewed from two perspectives. One is from the scientific support for a given relationship or for an understanding about the nature of the world and how it

Address correspondence to **Courtland L. Smith,** Department of Anthropology, Oregon State University, 238 Waldo Hall, Corvallis, OR, 97331-6403, USA. E-mail: csmith@oregonstate.edu

works. When a community of scientists tests and debates the results of experiments and observations, a set of facts emerge. This approach to defining facts has been labeled by Harris (1964, 1979, 1999, and 31–32) as an etic perspective. A second approach is to use the views of those within the system of study. In this case, the perspective is emic (Harris, 1964, 1979, and 1999, 31). The first approach assumes that scientific knowledge from an established group of experts is the basis for establishing facts. The second approach assumes that facts come from the members of society. This research tests the hypothesis that people can distinguish facts from values on an emic basis.

ETICS AND EMICS

The etic (et-ik) and emic (ee-mik) distinction was made by Pike (1954) (Headland, 1990). "For Pike, etics denotes 'an approach by an outsider to an inside system, in which the outsider brings his own structure . . ." (Harris, 1990, p. 49). Pike (1990, p. 28) says, "An emic unit . . . is a physical or mental item or system treated by insiders as relevant to their system of behavior. . . ."

The terms, "etic" and "emic," come from linguistic study. Phonetics are a wide variety of sounds that linguists have observed for human languages. In studying a language, a linguist uses the phonetics observed for all languages to identify the phonemics of a particular language that is being studied. Harris (1964) found the etic/emic distinction very useful for studying human behavioral and mental activities. He argues for etic and emic descriptions of human activities. Etics is the situation as described by an observer who is not from the culture. Emics is the description elicited from an insider who is a member of the culture. According to Harris (1999, p. 31), "Etic statements . . . depend upon phenomenal distinctions judged appropriate by a community of scientific observers," while ". . . emic statements describe social systems of thought and behavior whose phenomenal distinctions, entities, or 'things' are built up out of constraints and discriminations sensed by the participants themselves as similar or different, real, meaningful, significant, or appropriate."

Discussion of facts and values raises the question of whether people can distinguish between factual and value-oriented statements. To test whether people can distinguish factual from value statements an experiment on the emic definition of facts and values was conducted with several groups of students.

APPROACH

Students taking an upper division and graduate course, Natural Resources and Community Values, were asked to read a letter from five scientists about forest fire policy. The letter has 30 sentences (Figure 1). The first part of the letter, 16 sentences, lays out the case that the five scientists are presenting to President Clintion. Beginning with sentence 17, the letter tells what "management" should do and "must" avoid. The latter part of the letter gives the prescription of what should be done based on the initial facts presented.

Over a two-year period, four classes of 45, 44, 44, and 39 respondents read the letter and classified each sentence as being a statement of fact or one of values. The classes were one quarter graduate students, one half seniors, and one quarter juniors, sophomores, and freshmen. Women were 59% and biological science majors 60% of the class participants.

One of the course themes is the topic of values. Students read the letter early in the course after only a general definition of values. They were by no means experts in values analysis. The question was whether their emic experience in and familiarity with discussions of values would give them the tools to distinguish between factual statements and ones that are value statements. If the four classes saw the letter as having the same pattern of factual and value statements, then we can say that at least these

The President
The White House
Washington, DC 20500

Dear Mr. President:

This season has brought not only substantial and extensive fires throughout much of the west, but also a renewed debate on the relationship between fire and logging. [#1] Throughout the region, post-fire salvage logging is being proposed formally and informally as an appropriate or even desirable reaction to the fires. [#2] Concerning the region's streams and rivers—and the fish and other species that depend on those streams—there is considerable scientific reason to believe that salvage logging and the accompanying road building is one of the most damaging management practices that could be proposed for burned areas. [#3]

Fires can have substantial and seemingly negative effects on streams, particularly smaller streams. [#4] Fires may affect the delivery of sediment, the availability of woody debris and other organic materials, and the cycling of nutrients. [#5] While fires rarely kill fish outright, fires may directly affect the food chains that ultimately support the fish. [#6] Most importantly, fires can sometimes radically accelerate the delivery of sediment to stream channels which—if compounded by management—can produce chronic and substantial loss of in-channel habitat, and seriously delay the biological recovery of the stream. [#7]

However, viewed at the right scale of time and space, fires are not disasters for streams, indeed fires can induce natural ecological changes that benefit streams and the species that depend on them. [#8] The natural recovery of streams after fires can result in improved fish habitat if we do not interfere with the natural recovery processes that initiate themselves soon after the fires are gone. [#9] Fire-killed trees are a vital part of both watershed and stream recovery of the water-shed, and providing vital stabilizing structure in stream channels and floodplains. [#10] If fire-killed trees are logged out of the watershed, these functions, among others are lost for decades, even centuries. [#11]

Fires by their nature are extremely patchy. [#12] The local effects of a given fire can vary substantially from site to site, and the impact of fire on streams may be correspondingly variable. [#13] This year's fires are expected to have the greatest effect on small streams, on streams whose headwaters burned, in areas where fire intensity was high, and in areas where fires consumed a larger proportion of the watershed. [#14] Sediment impacts are greatest in areas of steep slopes, shallow soils, unstable geologies, and where thunderstorm or rain-on-snow intensity may be high. [#15] Streams are most vulnerable in the first decade following the fire. [#16]

Management activities that reinforce negative effects or undermine positive effects of fires must be avoided if streams are to recover. [#17] In particular management activities that add to the risk of increased sedimentation or that remove ecologically important large wood from the watershed present a substantial and long term threat to the recover of streams. [#18]

In this regard, logging and roadbuilding represent one of the most significant forces threatening to retard stream and watershed recover. [#19] Logging and roadbuilding accelerate sediment delivery rates, and are particularly risky to streams in areas of steep slopes, shallow soils, unstable geologies, and intense storms—precisely the areas already at greatest risk from the fires themselves. [#20] Roads distort the movement of groundwater, surface water, and sediment through the watershed and greatly increase the risk of mass failure—landslides and debris torrents. [#21] Both logging and roadbuilding increase the risk and severity of scouring floods that degrade aquatic food chains. [#22] Adding timber harvest and road construction to an already fire-damaged watershed can only have negative and potentially severe effects. [#23]

We know of no scientific reason to engage in salvage logging or roadbuilding in burned areas and we know of many sound reasons not to. [#24] Logging produces no known benefits to the streams, and entails very serious risks. [#25] We therefore strongly oppose a general public program of salvage logging and the accompanying roadbuilding in burned areas, simply because they have burned. [#26]

A patchy burned landscape may appear to be a catastrophe for the streams, but it is not. [#27] Neither is it a crisis. [#28] We must not allow the appearance of crisis to be used to promote ecologically inappropriate logging that may seriously retard natural recovery—eventually even enhancement—of the region's streams. [#29] As scientists, we believe the nation's public lands need a sound postfire policy, and we stand ready to assist in the development of that policy if that is desire. [#30]

Very respectfully yours,

Fig. 1. Scientists' 1994 letter to President Clinton about the relationship between fire and logging. The letter was used to evaluate students' ability to distinguish facts from values. (Sentence number are in brackets [])
(Continued)

s/ G. Wayne Minshall
Professor of Ecology
Idaho State University

s/ James R. Karr
Director, Institute of Environmental Studies
University of Washington

s/Judy L. Meyer
Professor of Ecology
University of Georgia

s/Christopher A. Frissell
Research Assistant Professor
Flathead Lake Biological Station
University of Montana
Research Associate, Oregon State University

s/Jack A. Stanford
Jessie M. Biernan Professor
Flathead Lake Biological Station
University of Montana

cc: Chief, USDA–Forest Service
Director, USDI-Bureau of Land Management
8 governors of western states
16 U.S. Senators from the same states as the governors
Sen. Robert Byrd, West Virginia
28 selected members of U.S. House of Representatives

Fig. 1. Continued

university students can emically distinguish facts from values. Further, the exercise illustrated for students lessons about the study of values.

To illustrate how social scientists measure environmental values, class members were asked to respond to the values question in Figure 2. The goal in asking students to respond to this question was to show one way values are measured. A second goal was to demonstrate to students that they were not representative of the general population. The course is selected by students with more of an environmental orientation. Most populations who have been asked to locate themselves on the environmental conditions-economic considerations scale measured by the question have 10–39% of the respondents on the economic side of the continuum (Bruce Shindler, personal communication; Steel et al., 2003). In the four classes, only three students showed a preference in the values question for economic considerations over environmental conditions.

The students judged each sentence in the letter as mainly factual, a statement of values, or could not be determined. The letter was used by Jay O'Laughlin at the 2000 meetings of the International Symposium on Society and Resource Management in Bellingham, Washington. O'Laughlin used this 1994 letter to President Clinton from scientists about forest fire policy in a facts and values workshop. O'Laughlin and Cook (2002) had letter readers distinguish between fact, value, myth, and unknown. O'Laughlin and Cook (2002) take more of an etic approach, introducing letter readers to definitions of facts, values, and myths based on Adams and Hairston (1995). The fact, value, and unknown distinctions match the class definition of fact, value, and could not determine. Adams and Hairston (1995, p. 16) define myth as "untruth or misconception presented as fact." The myth distinction made the issue of distinguishing facts from values too complex, and if respondents had questions about the veracity of a statement, they could mark it "can't tell." Since the letter writers were scientists, whose objective was to inform the President of the facts about forest fires and to suggest actions that could be taken, the assumption was that myth was not a technique they would use.

The research goal was to determine the pattern of responses in distinguishing facts and values. Since the letter was written by environmental scientists, would those with a more environmental perspective see the letter as more factual? In addition, three demographic questions, were included—class standing, gender, and major. The final question

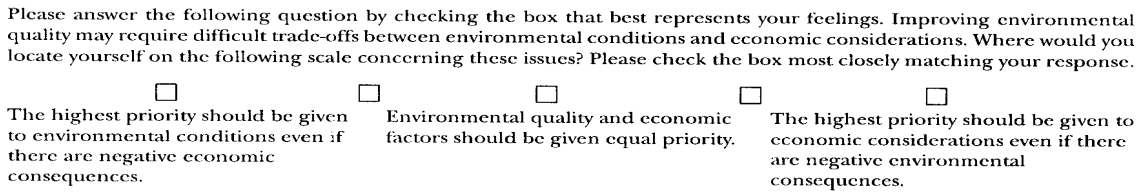

Fig. 2. Phrasing of question used to measure environmental and economic orientation of the four classes on the importance of environment conditions versus economic considerations.

asked students to place themselves on the environmental conditions-economic considerations continuum (Figure 2).

RESULTS

Three analyses were completed with these data. First, each class was analyzed independently to determine the reliability of the emic results. Second, all the responses were analyzed to see if some characteristic of the letter readers made them better or worse at distinguishing fact from value. Third, the average scores for each sentence were analyzed against writing style elements to see if something in the nature of discourse tipped off readers about factual and value sentences.

If sentences in the letter were identified as factual, they were coded 1. Value sentences were coded 3. If the respondent could not determine the factual or value content of the sentence, the code was 2. Average scores close to 1.0 meant that the sentence was seen by the majority of the class as factual. Average scores close to 3.0 meant that the sentence was seen by most as being a value statement.

Emic Class Patterns

In the first analysis, the average score on each sentence for each class, showed that no sentence was clearly seen by all students as a factual or value statement. Harris (1999) notes that all members of a culture will not see the culture in the same way, but a common pattern will emerge from emic data gathering. On a population basis the sentences judged by all four classes as factual and values-oriented were very consistent. Kendall's tau-b correlations for the sentence evaluation scores between the four classes are 0.95 to 0.98 (significant at $p < 0.001$). The standard deviation in average scores is less than 0.1.

If sentences with scores less than 1.8 are viewed as factual, 12 of the 30 sentences were judged to be factual. If sentences with scores greater than 2.2 are viewed as being value-oriented, 14 of 30 sentences were value-oriented. Four sentences fell in the "can't tell" category between 1.8 and 2.2. The break at <1.8 and >2.2 as the division for specifying a factual and value-oriented sentence is based on the majority of respondents judging the sentence as factual or value-oriented. This division is an etic imposition of the analyst. Moving the "can't tell" category to <1.6 and >2.4, reduces the factual sentences to 10, and the value-oriented ones to 12. In both cases the overwhelming majority of factual sentences occur in the first half of the letter and the value sentences are in the last. All four classes ranked the same three sentences as most factual (Table 1). For each of these sentences over 77% in each class saw them as factual. The four classes also ranked the same six sentences as most values-oriented. Over 72 percent of the students judged these sentences to be value-oriented. Thus, while uniformity was absent, sentences group in common patterns on a population basis as to their factual and value content as identified by study participants.

The respondents who could not judge a sentence as having either factual or value

Table 1
Average scores by class for the three most factual and six most value-oriented sentences (If every respondent chose the sentence as factual, the score would be 1.0. If every respondent chose the sentence as value-oriented, the score would be 3.0.)

Sentence	Class 1	Class 2	Class 3	Class 4
	Highest scored fact sentences			
5	1.3	1.3	1.2	1.3
13	1.4	1.4	1.2	1.3
15	1.2	1.1	1.2	1.2
	Highest scored value sentences			
17	2.7	2.7	2.7	2.8
23	2.8	2.8	2.9	2.8
24	2.8	2.8	2.8	2.6
26	2.9	2.7	2.7	2.7
28	2.8	2.7	2.7	2.9
29	2.9	2.8	2.7	2.9

content were relatively small. The percentage of "can't tell" responses averaged six percent. Half the students had no "can't tell" responses. Three fourths had two or less. Yet, two students marked 40 and 60% of their responses as "can't tell." Only 15 of 172 students (9%) had "can't tell" responses for 20% or more of the sentences in the letter. The average number of "can't tell" sentences per student was under 2. The small number of "can't tell" sentences identified suggests that factual and value-oriented distinctions are important in the student's culture. The pattern of factual and value-identified sentences suggests that an emic understanding of facts and values was present in the population of respondents.

Explanation of Patterns

In the second analysis, all student respondents were grouped into one population. Since the four classes had the same pattern in identifying factual and value-oriented sentences, the assumption was that for the purposes of this analysis they were one cultural population. From the student responses, a clear pattern emerges in which the first part of the letter (sentences 1–16) is seen as more factual, and the second part is seen as having more value statements (Figure 3). Factual sentences were

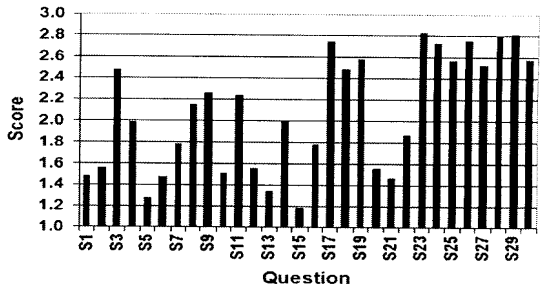

Fig. 3. Distribution of averages for all students on each sentence. Scores closest to 1.0 are averages that reflect sentences evaluated as factual. Scores closest to 3.0 are averages that reflect sentences evaluated as value oriented. The graph shows a pattern where the first half of the letter was generally seen as more factual (more short bars closer to 1.0). The last half of the letter was judged to be more value oriented (more long bars closer to 3.0).

10 of the first 16 sentences in the letter (scores < 1.8). Value sentences were 11 of the last 14 sentences (scores < 2.2). Of all factual sentences, 83% occurred in the first half of the letter, and 78% of the value sentences were in the second half.

The pattern distribution of average sentence scores shows that students tend to see the first part of the letter as more factual, while the latter part is more values-oriented. The letter writers were presenting forest fire ecology facts to President Clinton. From an emic perspective, the students saw the letter as more value-oriented than the scientists intended. The letter follows the etic scientific perspective that values or ethical interpretation should be on a factual base. The common scientific presentation is to lay out the facts and then interpret their meaning. O'Laughlin and Cook (2002, p. 28) found the same pattern of fact and value sentences in their analysis of the letter.

A factor analysis of the student responses reveals a pattern with three factors having eigenvalues of 3.6, 2.2, and 2.0. The first factor is one with the highest loadings (>0.4) on sentences judged as factual. The second and third factors are about values for good policy choices and the undesirability of sediment reaching streams.

While the pattern for the whole student population was consistent when analyzed from both a class and individual perspective, the student population was not uniform in its judgments about factual and value-oriented sentences. Can the variability in student responses be explained by other variables? Sociological research shows that values tend to be better in explaining people's orientations than demographic factors on many environmental management issues (Kempton et al., 1995; Borgatta & Montgomery, 2000, p. 2838; Dunlap et al., 2000; Vaske et al., 2000). The average individual scores for the letter were regressed against the student demographic factors and values about environmental conditions versus economic considerations. A significant regression model ($F = 7.0$, $p < 0.001$) had the values variable with the most significant standardized coefficient and the major being a close second. Students from biological disciplines and with an ecological orientation were most likely to see the sentences as factual. Neither class standing nor gender made significant contributors to the regression.

A second test of the role of demographic versus values variables looked at correlations of these variables with sentence fact-value averages. Significant nonparametric correlations (Kendall's tau-b, $p < 0.05$) were found with two of the sentences on class standing, two with gender, seven major, and nine on the values question. Biological science majors and those who gave priority to environmental conditions were more likely to see the letter's sentences as factual. The letter was written by biological scientists, and students have had classes describing the fire ecology issues covered in the letter.

Writing Style

The final analysis was to see if the way in which the sentences were written influenced their being seen as fact or value-oriented. This analysis is more of an etic analysis of the writing style elements of the letter. The unit of analysis was the 30 letter sentences. Three judges were asked to rank the letter's sentences according to several writing style elements. For this part of the analysis, the fact-value score for each sentence was correlated with writing characteristics such as passive or active voice, use of helping verbs, use of "may," and presence of the verb "to be." Strong or weak qualifying language in each sentence was noted, along with use of "should," "ought," "must," "oppose," and "believe" as value verbs that tell the reader a value statement is coming. Mood verbs were identified. Writing guides tell authors (Keene & Adams, 2002, pp. 463–464) that verbs expressing facts are in the indicative mood. Verbs expressing a wished for condition are subjunctive.

The strongest correlation was with value verbs (Kendall's tau-b $= 0.41$, $p < 0.02$). A negative correlation (Kendall's tau-b $= -0.35$, $p < 0.05$) existed between factual sentences and using the verb "to be," e.g., "be," "am," "is," "are," "was," "were." The negative correlation means that sentences constructed, "Something is . . .," were likely to be taken as value statements. Sentences with weaker verbs and qualifying language were more likely to be seen as factual. Sentence mood was not a determining factor. Discriminant analysis was used to explain the factual versus value scores of sentences. The first discriminant function with an eigenvalue of 2.9 had significant coefficients (Chi-square $= 53.4$, df $= 33$, $p < 0.02$) for the verb "to be" and passive voice not being associated with factual sentences. Value verbs and the use of "may" were associated with value sentences, as were helping verbs like "can," "have," and "might," along with qualifying adjectives.

CONCLUSION

This study suggests that facts in environmental policy discussions come from at least two sources—the emic views of the people to whom scientists are communicating and the etic view of a community of scientists. The letter analyzed was written by scientists to change federal policy

related to forest fires. The emic views of students saw the letter as less factual than the community of science writers.

The study results suggest several hypotheses for further testing. First, the emic definition of facts and values were quite consistent on a population basis. Four different classes identified the same strongly factual and value-oriented sentences in a letter. They evaluated the letter as having a consistent pattern of discussing the known facts about the relationship between fire and logging in the first part and then coming to recommendations for action that were more based on values in the second half of the letter. While no sentence was unanimously chosen as being either factual or value-oriented, a pattern of fact and value-oriented sentences was apparent.

The student respondents saw the letter as less factual than did the scientists writing the letter. Thus, the emic and etic mental view of facts and values differed between the receivers of the information and those presenting it. Further, the emic pattern associated with the letter is based on the cumulative pattern from the four classes. Within this pattern, considerable variability exists about what is factual and value-oriented about the letter. From a policy perspective, this suggests that individual voices heard in a debate may not accurately distinguish between facts and values. Since policy is often affected by powerful individual voices, people need to be careful about verifying statements by these powerful voices with corroborating evidence from the population they are speaking for. Suggestions such as Lee's (1993) "civic science," which blends citizen concerns with scientific needs in a process of adaptive management, might be useful.

A second hypothesis is that those who value the ecology more than the economy and have experience in the biological sciences will see the ecological points made by scientists as more factual. Demographic factors such as class standing and gender are not as useful in explaining the distinction between fact and value sentences. The implication of this hypothesis is that more science education may be desirable. The science education might be pointed at adult populations concerned with environmental issues.

Third, the way a letter is written influences how people distinguish between facts and values. Value verbs signal to readers the presence of a values sentence. Helping verbs, qualifying adjectives, and avoiding dogmatism with the verb "to be" are language associated with factual sentences. Thus, writing style and recognizing the limits of one's knowledge appear to contribute to the credibility given to scientific knowledge.

Finally, facts and values both interact in the way people judge information. The environmental conditions-economic considerations values question explained the most variance in sentence scores across the student population. A close second was experience with the content covered in the letter.

Sorting out the complex interaction between facts and values in people's interpretation of scientific information is difficult. The etic and emic approaches to knowledge suggest that two views of a culture are possible. One is the view of participants and the other is the view of the system as seen by experts. These two views do not always coincide. Harris (1999, 39) says, ". . . the observers must be prepared for discrepancies and contradictions in the emic and etic versions of the events in question." The students did not see the scientists' letter as having the factual base intended. Using the emic/etic distinction may be a useful tool in better understanding the interpretation of scientific information.

REFERENCES

AAA (American Anthropological Association). (2004). Commission to Review the AAA Statements on Ethics Final Report. Retrieved July 23, 2005: http://www.aaanet.org/committees/ethics/ethrpt.htm

Adams, P. W., & Hairston, A. B. (1995). *Using scientific input in policy and decision making.* Corvallis, OR: Oregon State University Extension Service, EC 1441.

Biersack, A. (1999). Introduction: From the "new ecology" to the new ecologies. *American Anthropologist, 101*(1), 5–18.

Borgatta, E. F., & Montgomery, R. (2000). *Encyclopedia of sociology.* New York: Macmillan Reference USA.

Culhane, P. J. (2001). *Research on society and natural resources*: A content analysis of the first decade. *Society and Natural Resources, 14*, 365–384.

Dunlap, R. E., Van Liere, K., Mertig, A. G., & Jones, R. (2000). Measuring endorsement of the new environmental paradigm: A revised NEP scale. *Journal of Social Issues, 56*, 425–442.

Friedman, S. T. (2003). Ethics of using science. *Journal of Forestry, 101*(2), 1.

Gross, D. R. (1992). *Discovering anthropology.* Mountain View, CA: Mayfield Publishing.

Harris, M. (1964). *The nature of cultural things.* New York, NY: Random House.

Harris, M. (1979). *Cultural materialism: The struggle for a science of culture.* New York, NY: Random House.

Harris, M. (1990). Emics and etics revisited. In T. N. Headland, K. L. Pike, and M. Harris (Eds.), *Emics and etics: The insider/outsider debate* (pp. 48–61). Newbury Park, CA: Sage Publications.

Harris, M. (1999). *Theories of culture in postmodern times.* Walnut Creek, CA: AltaMira Press.

Headland, T. N. (1990). Introduction. In T. N. Headland, K. L. Pike, and M. Harris (Eds.), *Emics and etics: The insider/outsider debate* (pp. 1–27). Newbury Park, CA: Sage Publications.

Kantrowitz, A. (1995). The separation of facts and values. *Risk: Health, Safety & Environment* 6(Spring), 105, accessed July 3, 2003 (http://www.piercelaw.edu/risk/vol6/spring/kantro2.htm.)

Keene, M. L., & Adams, K. H. (2002). *Easy access: The reference handbook for writers.* Mountain View, CA: Mayfield Publishing.

Kempton, W., Boster, J. S., & Hartley, J. A. (1995). *Environmental values in American culture.* Cambridge, MA: MIT Press.

Kottak, C. P. (1999). The new ecological anthropology. *American Anthropologist, 101*(1), 23–35.

Lee, K. N. (1993). *Compass and gyroscope: Integrating science and politics for the environment.* Washington, DC: Island Press.

O'Laughlin, J., & Cook, P. S. (2002). Resource management by espistle: The use of facts and values in policy-related communications. *Journal of Natural Resources and Life Sciences Education, 31*, 25–30.

Pike, K. L. (1954). *Language in relation to a unified theory of the sturucture of human behavior.* Glendale, CA.: Summer Institute of Linguistics.

Pike, K. L. (1990). On the emics and etics of Pike and Harris. In T. N. Headland, K. L. Pike, and M. Harris (Eds.), *Emics and etics: The insider/outsider debate* (pp. 28–47). Newbury Park, CA: Sage Publications.

Spradley, J. P., & McCurdy, D. W. (2000). *Conformity and conflict: Readings in cultural anthropology.* 10th Edition. Needham Heights, MA: Allyn & Bacon.

Steel, B. S., Clinton, R. L., & Lovrich, Jr., N. P. (2003). *Environmental politics and policy: A comparative approach.* New York, NY: McGraw-Hill.

Vaske, J. J., Donnelly, M. P., Williams, D. R., & Jonker., S. (2001). Demographic influences on environmental value orientations and normative beliefs about National Forest management. *Society and Natural Resources, 14*, 761–776.