Epistemological Models and Culture Conflict: Menominee and Euro-American Hunters in Wisconsin

Norbert Ross, Doug Medin, and Doug Cox

Abstract We describe how Menominee Native Americans and Euro-American hunters differ with respect to how they perceive and think about nature (here, specifically animals and plants of the forest) as well as the role of humans in it. We call these models epistemological frameworks—folk theories that allow individuals to make inferences in specific situations, guiding the acquisition and formation of new knowledge. Using an approach that combines ethnographic research from anthropology with experimental approaches from related cognitive sciences, we explore the within- and between-cultural distributions of ideas, values, and beliefs and their behavioral consequences. Findings indicate that stereotyping of other groups is largely driven by differences in epistemological frameworks and resulting categorizations and interpretations of observed or assumed behaviors. [cultural models, values, stereotyping, interethnic conflict, resource management, intracultural variation]

Once I used a rock to kill a goose that was flying by. It came down in a muddy area of the millpond. I hated wading in after it, but I couldn't let it go to waste.
—Menominee hunter

One time I caught an eight-pound smallmouth bass. A guy I know asked me if I was going to get it mounted. I said to him, "If your wife died, would you put her head up on the wall?"
—Menominee fisherman

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Recently a local business owner and friend received a letter and picture of me in the mail. The picture was of a buck I shot this year while gun-hunting. . . . On the photo were written the words "Bambi killer." The letter stated that we were Bambi killers and that we were making the trophy buck hunting in our county look bad. The buck was an 8-pointer with a 12-inch inside spread. . . . The farm I was on has been in QDM [*Quality Deer Management*] *for four years and this is not a buck that should have been shot. I made a mistake. I should have waited for a better look but I don't believe this to be a Bambi. If the buck had four more inches of spread I guess it would be a shooter to the person who wrote me the letter. . . . I have lost my privileges on that farm now and nobody is more sorry than me about what happened.*

—Excerpt from a letter to *Wisconsin Outdoor News*, March 3, 2000

Today's release can be tomorrow's trophy.

—Department of Natural Resources sign, Wisconsin boat landing, 2004

In this article we report data from a long-term research project among Menominee Native American and Euro-American hunters in north-central Wisconsin. The data combine ethnographic research from anthropology with experimental approaches from related cognitive sciences. This mixed-methods approach, combined with statistical models of within- and between-cultural distributions of ideas, values, and beliefs, allows us to explore detailed processes of stereotyping within their wider sociocultural context. The focus of our research is on epistemological frameworks for conceptualizing nature and their consequences for the production of stereotypes and intergroup conflict. Epistemological frameworks are folk theories that constrain the interpretation of experiences and guide inferences in specific situations. Specifically we argue that different epistemological frameworks among Menominee Native American and Euro-American hunters in Wisconsin create different understandings of human–animal interactions and the role of humans vis-à-vis nature.

The opening quotations reflect features of these epistemological frameworks: Whereas many Menominee interact with nature with a basic "do not waste" ethic and a focus on hunting for food, Euro-American hunters are more likely to stress other goals, including the goal of getting trophy game. Here the ethic is more on the sportsmanship and competition between hunters (*who gets the biggest buck*) and between hunters and the game (*outsmarting the biggest/smartest buck*). These differences in goals and epistemological frameworks, we argue, lead to different interpretations of behavior and ultimately result in stereotyping and conflict.

Native American epistemological frameworks such as the "do not waste ethic" and ideas that "everything has a role to play" and that "everything in nature has to be treated with respect" have received much attention in both popular and scholarly literature. Not only have these ideas informed new age religious movements (for better or worse), but they also have served to contrast Native American environmental ethics with prevalent thinking among Euro-Americans (see Davis 2000 for the Menominee and Callicott and Nelson 2004 for the Ojibwa).

Although the aggregate effects of cultural practices may be evident in the form of outcomes such as sustainable forestry (Davis 2000), little empirical support has been provided to show that folk theories actually affect how individuals reason about the world. We concur with White (1967) that epistemological frameworks (forming part of a larger worldview) have an effect on how we think about the world and as a result tend to guide certain aspects of our behavior. The relation, however, is not absolute, and especially larger worldviews (such as the Christian tradition) may not be detailed enough to guide specific behaviors. Rather, these worldviews are subject to individual interpretations and the modeling of more specific framework theories (see Ross 1997). In related work we show how nonprofessional Menominee and Euro-American fish experts differ along lines predicted by their differing epistemological orientations and how these differences translate into intergroup conflict over fishing practices and resource management (Medin, Ross, Atran et al. 2006; Medin, Ross, and Cox 2006). Of particular relevance is the finding that the degree to which individual Euro-American experts stereotyped Menominee values and practices was strongly correlated with the degree to which they endorsed the sportsman's model of fishing (e.g., targeting "prestigious" game fish rather than fishing for food).

In the present article we extend these findings into a different but related domain—hunting. The two main points of this contribution are (1) that for Menominee and Euro-American hunters between-group differences are minimal when compared with perceived differences and (2) that within-group differences are not noise but, rather, important information in predicting actual behavior of individuals—in the present case, out-group stereotyping.

Although our research takes self-identified cultural groups as the starting point, our analyses target both cross-group and within-group differences. This approach

has important methodological implications. Rather than assuming agreement, we describe group models emerging from ethnographic research and statistical analyses. Here between-group agreement and within-group disagreement (see Boster 1987) are equally important, with the former providing the background against which cultural differences can be understood and the latter allowing us a better understanding of cultural dynamics and associated behavior (see Ross 2004).

The Menominee Reservation and Its Surroundings

Life on and off the Reservation

The Reservation. The Menominee are arguably the longest continuous residents of Wisconsin. According to the historian David Beck (2002), there is evidence of Menominee presence for at least several thousand years. The Menominee are a woodland tribe, and prior to contact with Europeans they seemed to have followed a semisedentary village pattern that was organized around hunting, fishing, gathering, and some horticulture. By one estimate at one time they occupied approximately nine million acres of land (Keesing 1987). Today the Menominee reservation is only a tiny fraction of this, as Menominee lands were reduced treaty by treaty, leaving the tribe with approximately 234,000 acres of land. Well over 200,000 acres of the reservation are dedicated to forest, making it easy to identify the boundaries of the Menominee reservation. The rule of thumb is that the reservation begins where farmland ends and the forest starts (Davis 2000).

Today approximately four thousand Menominee live on the reservation, in and around four small towns. Menominee often live far way from neighbors in the forest. Descriptions of how to get to a person's house often go like the following: "After you cross the bridge go 2.3 miles and then take a right into the forest road. My house is in the first clearing."

The Menominee Nation is a sovereign entity, independent of the State of Wisconsin. Menominee maintain their own government, law enforcement, and school system. They are solely responsible for regulating actions on the reservations (in line with federal requirements) and, important for the present article, set their own fishing and hunting regulations.

In many ways Menominee life resembles a rural Euro-American lifestyle. Very few people are fluent in Menominee, and almost all children grow up with

English as their first language. Employment on the reservation is limited, and, as a result, many men and women seek jobs off the reservation. In 2000 the median family income on the reservation was $26,000, which compares with a median family income of $38,000 in Shawano County, located just south of the reservation. These numbers are misleading, however, because Menominee families tend to be larger (3.7 vs. 2.5 individuals in Shawano County). As a result approximately 35 percent of the reservation population live below the poverty line, compared with 8 percent in Shawano County.

Income levels likely affect orientations toward hunting and fishing. For Menominees hunting and fishing are not only a way to maintain their traditions as woodland people and to stay in close relation with nature but also play an important role in bringing high-quality food to the table. But Menominee values reflect much more than utilitarian concerns. Although the tribe lost a huge share of its land during the treaty era, their current lands have historical significance, and the reservation includes important landmarks and spiritual sites creating a "sense of place" as described by Basso (1996) for the Western Apache. Sites such as the Spirit Rock link Menominee living space directly to Menominee mythology and values.[1]

Shawano County. Shawano County was established in 1853 to exploit the rich timber resources of the area. In 1871 Shawano was incorporated as a village. Although the initial focus was on extracting the available timber, a second wave of settlers converted the deforested areas into farmland. The 2000 census shows 40,944 inhabitants. Agriculture—the typical Wisconsin dairy farm—and light industry are important sources of employment in the area. Snowmobiling, hunting, and fishing have become important attractions for regional tourism. Life in rural Wisconsin is remarkably different from urban U.S. life. Hunting and fishing are still major activities, although the focus has changed from food toward recreation and sport. In many cases family life is more important than having a career (and moving away), and, as a result, most people have much of their extended family in the area and a large network of friends. Maybe the most remarkable indications of change in attitudes toward fishing and hunting are the growth of fishing contests (with corporate sponsorships and prize money up to $25,000) and the growing privatization of hunting areas (see below). Obviously, these changes are not specific to Shawano County or Wisconsin, yet they are absent from the reservation.

Intercommunity Relations

Intercommunity relations reveal a mixed picture. Quite a few Menominee send their children to Shawano schools, work in Shawano, or even live there. On-reservation logging contracts are frequently awarded to logging companies based off the reservation. In addition, many Euro-American students attend the College of the Menominee Nation. At the same time there are also stereotyping and prejudice directed at Native Americans. Menominees complain about being followed in stores as a form of racial profiling. The struggle over Native American fishing and hunting rights is also seen as infused with racism (Bobo and Tuan 2006).

There appears to be resentment on the part of Euro-American hunters and fishermen toward Native Americans in general and Menominees in particular.[2] This resentment focuses on two related topics. First, whereas Menominees can acquire a state license and hunt or fish off the reservation, outsiders cannot do the same on the reservation. Second, regulations are perceived as more liberal on than off the reservation. Only some of these perceptions are accurate; for example, the tribe has a longer gun hunting season for deer. Others are simply wrong or exaggerated. For example, contrary to widely held Euro-American hunters' beliefs, Ojibwa but not the Menominee hold special off-reservation hunting and fishing rights.

Finally, only a few Shawano County hunters are aware of Menominee hunting regulations. Some allege that there are no regulations on the reservation; others wrongfully claim that "shining"—blinding a deer at night with a spotlight—is allowed on the reservation.

Life with the Forest

Menominee have an international reputation for sustainable forestry. The Menominee forest is richer in larger trees, has a richer mix of species, and is denser even than the Nicollet forest (a state forest preserve area) to the north. It also has a higher per-acre production of timber and maintains a higher number of board feet of commercial species (Davis 2000). By no means untouched and pristine, the Menominee forest has been managed for timber production for more than a century. Therefore, the health of the forest is the consequence of a careful and successful forest management system. In the words of Menominee Forestry Chief Marshall Pecore: "When the Menominee Reservation was

established in 1854, there were an estimated 1.5 billion board feet of sawtimber growing stock. From 1865 to the present more than nearly 2 billion board feet of sawtimber had been harvested. The most recent inventory indicates that sawtimber stocking is still at least 1.5 billion board feet, even after 138 years of harvesting this same acreage" (1992:16). The forest not only provides timber for the Menominee but also is a place for hunting, as well as for gathering non-timber products such as berries, ginseng, and other plants.

Hunting still provides an important food source. Menominee are avid hunters, and both bow hunting and rifle hunting are practiced on the reservation. A number of Menominee hunt bears, which are used for their meat, fur, and medicinal purposes. The bear population appears to be healthy on the reservation. Given the isolation of the Menominee forest, no moose are found, and the wolf population is quite small.

When we started our research in 1997 a specific season for "shining deer" existed. Shining involves using a spotlight to detect deer at night. The deer often freeze in the powerful light, providing extra time for hunters to shoot. The State of Wisconsin prohibits both hunting deer at night and shining. Not only is shining illegal, but it is also considered immoral and unsporting by Euro-American hunters, on the theory that it provides an unfair advantage to the hunter.

The Menominee Tribe outlawed shining in 2000. It is noteworthy, however, that even prior to this, many Menominee opposed shining as a hunting practice. Menominee opposition to shining does not focus on the morality of the practice but on the morality of not wasting game. A deer shot and injured at night may be hard to track down. For Menominee hunting is much more about food provision than sport, and therefore efficiency is more a concern than notions of "fair chase."

To this day, many local Euro-American hunters are not aware of the fact that shining has been banned on the reservation. In addition, given the relatively low priority for Menominee of trophy hunting, some local Euro-American hunters think that Menominee hunt along the lines of "the more, the better," depleting the deer population on the reservation. Statements such as "You can drive through the reservation and not see a single deer—because they shoot them all" are fairly frequent. The observation that deer population density is

lower on the reservation than off is correct (Medin, Ross, Atran et al. 2006), albeit not causally linked to shining or poor Menominee hunting practices. The carrying capacity of forest patches surrounded by cornfield is several times higher than that of pure forested areas, such as the Menominee reservation (Medin, Ross, Atran et al. 2006).

The estimated deer population per square mile on the Menominee reservation over the three years 2002–04 was 10.2, 9.2, and 11.0, respectively (Medin, Ross, Atran et al. 2006). These figures are within the range of the estimated carrying capacity (the maximum for a healthy population) for a forest habitat (Medin, Ross, Atran et al. 2006). In contrast, Shawano County (as most of Wisconsin) is burdened with deer overpopulation, often twice the level that wildlife biologists think is proper (Medin, Ross, Atran et al. 2006).

What is the source of this overpopulation? Although it is easy to blame the lack of natural predators (e.g., wolves), the situation is largely related to hunters' interests, beginning with the focus on shooting bucks over does, a practice that minimizes population control. It seems straightforward to conclude that deer overpopulation means that deer hunting will be good. Surprisingly, however, this seems not to be the case. A recent online poll of hunters by *Wisconsin Outdoor News* indicated that 29 percent of hunters rated the opening weekend as average and 53 percent rated it as poor.

Over the past several decades there has been an increasing "privatization" of hunting lands. In times past farmers would often grant permission to hunt on their lands, and hunters usually reciprocated with a token gift (e.g., a deer tenderloin). Nowadays many hunters own 40-acre parcels or organize themselves into small groups that pay a large part of a farmer's real estate taxes in exchange for *exclusive* hunting rights. Within this context, baiting (feeding) deer becomes a measure to keep deer within these private hunting grounds, allowing in turn "quality deer management" aimed at producing large bucks. In essence deer are being converted into private property.

Two consequences of this development are, first, that deer are increasingly scarce on public lands and, second, that the Wisconsin Department of Natural Resources has less and less control over deer management (because of limited regulatory access on private lands). Deer management becomes an emergent property of the collective practices of people and institutions with different

access, power, and interests. No state law exists requiring landowners to shoot a certain number of deer on lands not open to the public. With its limited powers the Wisconsin Department of Natural Resources has largely failed to deal effectively with the overpopulation of deer.

The following represents a summary of changes in the Wisconsin deer population and state hunting regulations over more or less the past century:

1897 First bag limit for deer (two per season)

1915 First buck-only season

1919 Estimated gun kill of about 25,000

1925 Legislature passes law closing the deer season every other year

1941 Gun kill of deer around 40,000

1943 First antlerless deer season in 24 years

1958 Gun kill of deer about 95,000

1962 Deer population above 400,000

1978 Record gun kill of 150,845

1985 Fifth consecutive record kill of 274,302 deer

1990 Prehunt herd estimated at 1,300,000 (and record kill of 350,040)

1999 Prehunt herd estimated at more than 1,500,000 (record harvest of 402,204 deer)

2004 Fall population of deer estimated to be 1,700,000

Unfortunately, no comparative data for the Menominee reservation exist, nor do we have consistent herd estimates prior to 1990. But obviously, "there's no time like the present" when it comes to deer. The state population of deer has been growing steadily over the past 40 years, and so has the deer harvest. The 1999 harvest was equal to the estimated total 1962 herd. Note that early in the 20th century there was a concerted effort to increase the deer population, by, for example, only allowing bucks to be shot (Medin, Ross, Atran et al. 2006). It is paradoxical that the current focus in the Euro-American community on shooting large bucks comes at a time when Wisconsin faces serious deer overpopulation.

In summary, the consequences of Menominee practices are a healthy forest and an appropriately sized deer population. The result of Euro-American practices in

Wisconsin more generally, including Shawano County, is an overpopulation of deer.[3] The Menominee Tribe manages deer as part of an overall forestry management plan that values biodiversity. Given the trend of privatizing hunting grounds, the State of Wisconsin has limited opportunities to manage the deer herd. In addition, legislators have to face a constituency including many members more interested in numbers of trophy bucks than carrying capacities. This also has economic repercussions, as hunting is both a sport and a huge business.

Resource Conflict

Conflict over resources often originates in value differences. Everyone appears to be an environmentalist (Kempton et al. 1995), at least until values are placed in conflict. Although almost everyone would like to save whales, few in the United States would reduce health care spending to save them.

Values in different domains such as the environment and economy may be inherently irreconcilable in the sense that there is no single rational solution to these conflicts. What is the monetary value of a dolphin's life? Is it more important to save a forest, to maintain clean air, or to save jobs that provide family incomes? There is no correct answer to these questions, as they depend on value judgments and trade-offs.

In this project we investigate some of the underlying reasons for conflict over a common resource, deer and other game, between Menominee and Euro-American hunters. Although the conflict is mostly nonviolent, threats to Menominee sovereignty should be perceived as violent acts.[4]

We have been exploring how Menominee and Euro-American people perceive one another's values and attitudes and how these perceptions give rise to misperceptions and stereotyping. Both groups share many of their basic attitudes and values, and many individuals in each community have the same superordinate goals in mind—shooting game and maintaining a habitat for game in the area. Yet the groups work largely under different assumptions—*epistemological frameworks*—that inform individuals of what hunting is about, lending different meanings to hunting as an activity and to the game involved.[5] These assumptions also lead to different orientations toward practices.

By *practices* we mean the what, when, how, and how many of hunting. Overall, Menominee and Euro-Americans do not differ in *what* they hunt for food

(deer, bear, turkeys, rabbits, squirrels, ducks, geese, grouse) or for pelts (beaver, mink, muskrat, fox, coyote, bobcat, otter, weasel). A fair number of Menominee who belong to the bear clan do not hunt bear; other members have been taught that they can hunt bear, as long as proper respect is shown and all the parts of the bear are used. Menominee use more than just the hide and meat of bears (e.g., the tallow) and are also somewhat more likely to eat the meat of other fur-bearing animals as well.

Some Euro-American hunters complain about Menominee shooting does and other antlerless deer. This criticism is often evoked within the context of "quality deer management" and the ethic of hunting as the challenge of tracking down and killing a trophy buck. There is more criticism over the *how*s of hunting. In addition to the incorrect impression that shining deer is still allowed on the reservation, there are two other differences that upset many Euro-American hunters. Both groups use dogs for hunting bear, but only Menominee are allowed to use dogs to drive deer. Menominee are also allowed to hunt from their vehicles on backwoods roads and to shoot game from their (truck) windows.

There are also some differences in the *when* of hunting. Menominee deer season is usually longer, including a bucks-only season in September. The State of Wisconsin is also more precise in specifying hunting hours. Each year a regional guide is published prescribing what hour and minute hunting may begin and end. Menominee regulations simply state that hunting begins at dawn and ends at dusk. We have never heard a complaint about the time-specific aspect of state law, yet plenty of stories exist about the watch-wearing bucks, which come out only minutes after the official end of the hunting day.

Finally, the *how many* of hunting also produces complaints from either group. Enrolled tribal members may take up to five deer each year. That may seem like a lot, but off the reservation the rules are more liberal. The State of Wisconsin has a bow and arrow season, a gun season, and even a musket season. In addition, in almost all parts of the state, there are T-zones where one can get a tag to shoot an antlerless deer, fill it, and then get another tag for another antlerless deer, and so on. In other areas "earn-a-buck" programs are in place where one first has to kill an antlerless deer to get a tag allowing one to shoot a buck.

In summary, the biggest complaints of Euro-American hunters about Menominees center on shining, road hunting (mainly in the context of shining), and using dogs for deer, all of which results (in the eyes of Euro-Americans) in the depletion of a common good: deer. Menominee tend not to complain about Euro-Americans; but when they do, it is about the apparent focus on getting a trophy-sized buck and the related perception that disrespect comes with killing a deer as a trophy or out of sport alone.[6] To be sure, some Menominee also collect trophies, and some Euro-Americans share Menominee values associated with subsistence hunting. All in all the similarities of practices in the two groups are greater than the differences. Both groups require that a person complete hunter safety class and pass a test on it before being issued a license. In addition, however, the Menominee class also spends time talking about cultural values and the do not waste ethic.

Culture as a Distribution of Ideas and the Cultural Consensus Model

The focus of this study is as much on within-group variability in values, practices, and perceptions as on cross-group differences. Within-group differences are important on several accounts. First, they prevent us as researchers from stereotyping our subject groups.[7] Second, within-group differences allow us a better understanding of encountered cross-group differences. Third, the existence of within-group differences with respect to stereotyping allows us to better understand the specific conditions and causes that lead to the development of stereotypes (see Ross 2004 for such an approach to within-group differences).

Our research often uses statistical tests for reliability. In the case of group comparisons, however, it is easy to overinterpret differences and as a consequence downplay cross-group agreement or within-group differences. To avoid this we employ the cultural consensus model (CCM; Romney et al. 1986) both within and across groups. The CCM allows us to explore patterns of agreement (and disagreement) within and across groups: for example, Who agrees more strongly with one another or with the consensus? Who agrees more with one another than predicted by the consensus model (Nakao and Romney 1984; Ross 2004)? The CCM assumes that widely shared information is reflected by high agreement across individuals. It consists of a principal component analysis

over the interparticipant agreement matrix (Romney et al. 1986). A consensus is found to the extent that the data overall conform to a single-factor solution. In this case first factor scores represent the participants' agreement with the consensus, for example, the extent to which a person agrees with everyone else.

In case of consensus, the CCM justifies the aggregation of individual responses into a "cultural model" (Ross 2004). General agreement may be coupled with systematic disagreement, and the CCM is an effective tool for uncovering both shared and unshared knowledge.[8]

In related studies we found that Menominee and Euro-American fishermen share a common model yet differ reliably on specific submodels (Medin et al. 2002; Medin, Ross, Atran et al. 2006). Despite similar goals—catching fish—Menominee and Euro-American fishermen act under distinct epistemological frameworks, and this proved useful in analyzing stereotypes. For example, we not only substantiated within-group variability on stereotyping but also were able to predict the amount of stereotyping expressed toward Menominees by a Euro-American fish expert in both the conceptual organization of fish and degree of focus on fishing for sport.[9] These findings illustrate how epistemological frameworks provide the basis for differential value judgments, leading to different perceptions of group actions and stereotyping.

Do these differences carry over to another domain, hunting? There are reasons to believe they do. First, Menominee and Euro-American fish experts are more frequently than not also avid hunters. Second, the epistemological frameworks concerning orientations toward nature (e.g., everything has a role to play) are likely to be broad enough to encompass both hunting and fishing.

Study 1: Familiarity and Importance

So far we have presented an ethnographic account of our work. The experimental component builds on the ethnography, expanding it at the same time with respect to detail and focus. Initially we asked a sample of Menominee and majority-culture hunters to name the most important plants and animals of the forest. From the resulting list we selected 29 animal and 39 plant kinds. Next, we asked each hunter to indicate his familiarity with each kind ("have heard of the kind," "could recognize one," and "have seen one"). Participants were also asked to rate (on a seven-point scale) the importance of each kind to the forest

("How important is X to the forest?") and to themselves ("How important is X to you?"). Instructions were intentionally ambiguous to keep the rationale for an individual's ratings as unconstrained as possible. Justifications were recorded.

Participants were 17 Menominee and 15 majority-culture hunters. We employed peer nomination ("Who are the expert hunters in your community?") to pick our participants.[10] On average nominated experts had been hunting for over 20 years.

Exploring familiarity (with plants and animals) is important on at least two grounds: First, hunting has a focus on game; as such we were curious to see whether we would find differences with respect to familiarity with, as well as the evaluation of, plants and nongame animals. Second, previous research (Atran et al. 1999; Atran et al. 2002; Medin et al. 1997; Ross 2002) has shown that expertise influences the organization of conceptual knowledge. We suspected that the same might be true for the evaluations of species. As a result, to understand evaluations of species across cultures, we needed to control for differences in familiarity with these species across members of the two groups (see Medin et al. 2002; Ross 2004).

Why use importance ratings? Importance ratings directly test our hypothesis that Euro-American and Menominee hunters evaluate nature from different epistemological standpoints. If Menominee hunters employ multiple goals in approaching nature, as we found among Menominee fishermen (Medin, Ross, Atran et al. 2006), we should find higher importance ratings for a greater range of flora and fauna for Menominee than for majority-culture hunters. Epistemological differences should also show up in justifications and in the relation between importance to self and importance to the forest ratings. For example, if importance to self is based on personal goals, it may conflict with or be uncorrelated with importance for the forest ratings. Alternatively, if a hunter values the health of the forest, then there may be a correspondence between importance to the forest and importance to the self.

Results of Familiarity and Importance Tests

Familiarity with Animals. Essentially we did not find any differences in familiarity with the exception of the junco. Euro-American hunters were twice as likely to report having heard of or being able to recognize a junco than were Menominee

(Euro-American [EA] = 0.76 vs. Menominee [M] = 0.38) and were also more likely to report having seen this bird (EA = 0.64 vs. M = 0.33).[11] We suspect that the difference arises because of the habitat of the junco, forest edges, a habitat seen more frequently off the reservation than on.

Familiarity with Plants. As expected, most of our participants reported having heard of most of the plants. In reported recognition we find group differences for three plants only. Euro-American hunters were more likely to recognize cowslip than were Menominee (EA = 0.86 vs. M = 0.53).[12] We suspect that many Menominee know this plant as marsh marigold, a name we heard subsequent to this study. However, Menominee hunters were more likely to report being able to recognize and having seen bitterroot (M = 0.84 vs. EA = 0.40) and basswood (M = 1.00 vs. EA = 0.73).[13] These species are culturally more salient for Menominee, who employ bitterroot for medical purposes and traditionally used the bark of the basswood in basketry and the shell of their wigwams. Basket making still takes place on the reservation, and wigwams are built, although mainly to instruct youth in Menominee traditions.

In summary, familiarity with our sample of plants and animals seemed to be more or less equal for members of the two groups. Given that we selected our sample of species based on free listing of species that participants knew, this is not surprising.

Importance Ratings. Recall that this task was designed to test for effects of different epistemological frameworks. The hypothesis is that Menominee will show higher importance ratings for a greater variety of plants (because everything has a role to play in nature and Menominee approach flora for multiple purposes). It is noteworthy that we had to exclude the responses of six Menominees (and only Menominees) for the lack of variance within their ratings. All of them gave the highest possible importance ratings to all the species. Although we cannot include these responses in our analyses, these data must not be treated as noise. On the contrary, this response pattern marks the Menominee worldview that "all things are interdependent and consequently, equally important." Our interpretations are furthermore supported by the justifications these individuals gave for their responses, namely, that everything has a role to play. Obviously, the difference is highly significant by a binomial test, as no majority-culture hunter showed such a response pattern or offered such a justification.

Importance of Plants. Mean ratings for the importance of various plants to the forest and to oneself for each group are summarized in Tables 1 and 2. We excluded the species from the list for which fewer than 65 percent of our participants indicated familiarity.

Consensus Analysis for Plants. With respect to plants, we found neither within- nor cross-group consensus on ratings of importance either to the forest or to the self. Two potential reasons might explain this result: First, being an expert hunter does not necessarily lead to coherent value judgments of plants, although it might have this effect for animals. That plants are not seen to be as important as animals is somewhat supported by the fact that participants were less familiar with plants than animals. Second, the lack of consensus may reflect a diversity of perspectives (values), tending to undermine consensus.

The lack of consensus does not allow us to aggregate the data, and, as a result, one should be cautious about generalizations concerning group differences. Still, our hypothesis appears to be strongly supported by the data. Menominee hunters gave reliably higher ratings for plants with respect to importance to the forest (means of M = 5.3 and EA = 4.5).[14] This main effect was accompanied by a moderately high correlation between Menominee and Euro-American ratings of plants (Rxy = 0.66, $p < .01$). Both groups tended to give the trees higher ratings than other plants.

Essentially the same pattern was observed for ratings of importance to the self. Again, the main effect is statistically reliable (means of M = 5.2 vs. EA = 4.1).[15] The correlation between overall Menominee and Euro-American ratings was again moderately high (Rxy = 0.74, $p < .01$), and once more trees tended to receive higher ratings than other plants.

One challenge in this sort of research is to determine whether the differences observed in ratings reflect use of the scale or real differences in valuation (Does a Euro-American "5" reflect a higher value than a Menominee "6"?). To address this question we look at justifications for answers. Three observations suggest that the differences are real.

First, 9 of 17 Menominee hunters provided justifications in terms of general statements that every plant has a role or part to play and hence is important to the forest. No Euro-American hunter provided this type of justification (allowing

TABLE 1. Rated Importance of Plants to the Forest

Plant	Menominee	Euro-American
white oak	6.5	6.1
cedar	6.3	5.5
white pine	6.3	4.6
fern	5.3	4.4
hemlock	5.8	4.2
cherry tree	5.7	4.3
witch hazel	4.7	4.0
ginseng	5.8	3.3
thorn apple	5.4	4.6
chokecherry	6.0	4.7
elm	5.6	3.3
white birch	5.7	3.8
popple/poplar	5.6	4.8
gooseberry	4.1	3.9
blackberry	6.3	5.0
bitterroot	5.8	1.0
skunk cabbage	4.8	2.4
Solomon's seal	4.7	1.5
blueberry	5.3	4.7
cranberry	5.6	4.3
alder	4.8	4.3
hickory	5.6	4.2
butternut	5.7	4.5
sumac	4.5	2.8
wild ginger	5.5	1.7
white ash	6.0	3.9
black spruce	5.1	4.3
dogwood	5.0	2.6
red maple	5.6	4.2
elderberry	5.6	3.9
basswood	5.6	3.6
cowslip	4.4	2.5
bloodroot	5.4	2.0
trillium	4.9	4.1
prickly ash	4.9	3.6
wild columbine	3.0	2.8
cattail	5.6	4.4
silver maple	5.3	4.1
red oak	6.1	6.0

Note: The ratings are based on a seven-point scale.

TABLE 2. Rated Importance of Plants to the Self

Plant	Menominee	Euro-American
white oak	6.0	6.0
cedar	6.2	4.9
white pine	6.6	5.1
fern	4.6	3.6
hemlock	5.4	3.9
cherry tree	5.5	4.3
witch hazel	4.8	3.8
ginseng	5.8	4.4
thorn apple	4.4	2.9
chokecherry	5.0	3.2
elm	5.4	3.1
white birch	5.8	4.2
popple/poplar	5.5	4.4
gooseberry	4.0	2.9
blackberry	6.4	5.2
bitterroot	6.1	2.7
skunk cabbage	3.7	2.7
Solomon's seal	4.7	1.5
blueberry	5.4	4.7
cranberry	5.3	5.3
alder	4.0	2.6
hickory	5.6	4.7
butternut	5.6	4.6
sumac	4.3	2.1
wild ginger	4.6	2.2
white ash	5.6	4.4
black spruce	4.6	3.6
dogwood	2.9	2.1
red maple	6.0	4.6
elderberry	3.9	3.8
basswood	4.9	3.3
cowslip	3.7	2.8
bloodroot	4.8	2.0
trillium	4.5	4.0
prickly ash	4.1	2.0
wild columbine	2.7	2.5
cattail	3.7	3.4
silver maple	4.6	4.2
red oak	5.7	5.5

Note: The ratings are based on a seven-point scale.

instead much more for the nonfunction of a plant). This group difference is highly reliable by a Chi-square test.

Second, within their justifications for their self ratings Menominee hunters mentioned more uses or sources of value for both plants and animals than did the Euro-American hunters. There was a reliable difference (by Chi-square test) for use of plant material (including medicinal uses of plants) and for justifications in terms of religious, cultural, or symbolic value (and in the case of animals, clan relevance).

Third, with respect to the importance to self ratings, several Menominee hunters mentioned that if something is important to the forest, then it is important to them. Again, no Euro-American hunter provided this kind of justification. Apparently, then, the differences in ratings are real, supporting our hypotheses and interpretations of the data. Menominee approach the plants of the forest from a multiple-goal perspective and ascribe a role (and hence importance) to every single plant.

Looking at more specific differences, we find Menominee hunters giving reliably higher importance to self ratings for cedar, white pine, hemlock, chokecherry, elm, ginseng, white birch, blackberry, sumac, and red maple. These differences are related to particular cultural and ecological factors. For example, hemlock is culturally significant, is abundant on the reservation, and makes a good perch for birds. Uses for other plants range from economic (white pine) to ecological importance (cedar provides habitat for deer).[16] In sum, for the Menominee the forest represents much more than a habitat for game and the background for hunting.

The high importance values reported by the Menominee are just one side of the story. In comparison, Euro-American hunters were more likely to report either that a plant had little use to the forest or that they could not think of any. We suspect that this reflects both a lack of knowledge and a more narrow definition of utility. Euro-American hunters were also almost twice as likely to describe a plant in negative terms, but this difference fell short of statistical significance.

In sum, with respect to plants the data point in the direction predicted. Menominee hunters employ a broader perspective on the forest than Euro-American hunters.

Self versus Forest Ratings for Plants. Are the same plants that are important to the forest also important to the self? For this analysis we correlated the ratings for each individual (forest vs. self). On average the same correlation is found for both Menominee and Euro-American hunters ($r = 0.63$), indicating that for both groups the ratings are closely related to one another. In justifications from members of both groups we often heard that "plant X is good because it offers food to animals."

Importance of Animals. The mean ratings of the importance of various animals to the forest and to the self are given in Tables 3 and 4, respectively. They show the same pattern as ratings of plants. Menominee hunters consistently gave higher ratings for both (importance to the self: M = 4.5 vs. EA = 3.7; importance to the forest: M = 4.9 vs. EA = 3.7).[17]

Importance of Animals to Self. We conducted a consensus analysis to examine within- and across-group agreement. First, with respect to importance to the self, we find an overall cross-group consensus.[18] Euro-American hunters showed higher first factor scores (suggesting higher agreement) than Menominee. Multiple evaluation schemes, as described for the Menominee hunters, should lead to lower agreement. Separate analyses for each group confirm this pattern, and residual analysis of the overall data show that Menominee, but not Euro-American hunters, have reliably greater within-group than cross-group residual agreement.[19]

To explore the models of both groups in detail we conducted regression analyses (separate for each group) to evaluate predictions that (1) game animals would be regarded as more important than others and (2) mammals would be evaluated differently than nonmammals. The regression is significant for both groups. For Menominee hunters, however, the regression is significantly weaker and the life-form of an animal does not have predictive value.[20] On average for Menominee hunters game animals received higher ratings than nongame animals (game: M = 5.1 vs. nongame: M = 4.1).[21] For Euro-American hunters the overall regression is notably higher, and both life-form and hunting contribute significantly to the regression model.[22] Somewhat surprisingly, Euro-American hunters rated nonmammals higher than mammals (nonmammals: EA = 4.3 vs. mammals: EA = 3.2).[23] They also rated game animals on average higher than nongame animals (game: EA = 4.7 vs. nongame: EA = 3.2).[24] Finally, we looked at group differences with respect to the importance ratings

TABLE 3. Rated Importance of Animals to the Forest

Animal	Menominee	Euro-American
coyote	5.6	4.3
fox	5.1	4.4
deer	6.1	4.8
bobcat	5.7	3.8
wolf	5.6	4.2
bear	5.8	4.6
raccoon	4.8	3.3
possum	3.1	1.8
mouse	4.6	3.5
partridge	5.5	4.6
rabbit	5.5	4.1
squirrel	5.4	4.6
grouse	5.5	4.6
beaver	4.7	3.7
eagle	6.1	5.0
hawk	5.6	4.6
turkey	4.4	4.2
chipmunk	4.2	3.4
otter	5.2	3.1
porcupine	4.1	2.2
woodpecker	5.4	4.0
owl	5.1	4.6
turtle	4.4	2.8
blue jay	4.5	2.7
robin	4.6	3.2
skunk	3.8	2.6
wood duck	4.5	4.0
finch	4.4	3.5
junco	5.2	2.9

Note: The ratings are based on a seven-point scale.

of game and nongame animals. We find no difference for the rating of game animals. Menominee, however, rated nongame animals significantly higher than Euro-American hunters.[25]

This last result is important on two accounts. First, it undermines the potential critique that group differences in ratings might reflect different use of the

TABLE 4. Rated Importance of Animals to the Self

Animal	Menominee	Euro-American
coyote	4.8	3.2
fox	4.5	3.5
deer	6.6	6.6
bobcat	4.9	3.5
wolf	5.0	3.3
bear	6.3	5.1
raccoon	3.9	2.4
possum	2.6	1.3
mouse	3.0	1.8
partridge	5.6	5.5
rabbit	4.9	4.3
squirrel	4.3	3.8
grouse	5.6	5.3
beaver	4.9	2.9
eagle	6.4	5.7
hawk	5.3	4.3
turkey	5.0	5.8
chipmunk	3.6	2.9
otter	5.1	3.7
porcupine	4.0	1.8
woodpecker	4.6	3.4
owl	4.6	3.9
turtle	4.9	2.6
blue jay	4.2	3.2
robin	4.1	4.6
skunk	2.8	1.8
wood duck	4.6	5.3
finch	4.4	3.8
junco	4.7	3.1

Note: The ratings are based on a seven-point scale.

rating scale. If this were the case Menominee should be giving higher ratings in both cases. Second, it again confirms the hypotheses, that in contrast to Euro-American hunters, Menominee use multiple perspectives to evaluate animals, hunting being only one of them.

Menominee hunters gave reliably higher ratings for the following animals: coyote, wolf, bear, raccoon, opossum, beaver, otter, porcupine, and turtle.

These differences appear to derive from a pattern of *not strongly discounting any species* and broad sources of significance and utility.[26] The only two kinds to which Menominee gave a lower-than-midpoint (3.5) rating were skunk and opossum, the latter being a nonnative species that many consider to be a nuisance.[27] Euro-American hunters gave below-midpoint ratings for skunk, opossum, coyote, wolf, raccoon, beaver, porcupine, turtle, blue jay, woodpecker, chipmunk, and mouse.

Importance of Animals to the Forest. If every animal is important to the forest, then it is not clear that we should expect to see a consensus on ratings of relative importance. Indeed, we failed to find either across- or within-group consensus, making the analysis of group differences problematic.

With respect to the importance of animals to the forest, Menominee hunters gave a below-midpoint rating only for the nonnative opossum (compared with raccoon, chipmunk, otter, porcupine, turtle, blue jay, robin, and skunk for Euro-American hunters). They gave reliably higher ratings to coyote, deer, bobcat, wolf, bear, raccoon, rabbit, otter, porcupine, turtle, and blue jay. A variety of reasons accounts for these differences, and we will only offer an illustration. A common response among almost all majority-culture hunters was to note that porcupines are destructive because of their habit of girdling trees. Menominee know about this effect too, yet some added that this action opens up the forest and allows smaller plants to grow, which in turn provide ground cover that helps maintain moisture. This illustrates both the individual ecological knowledge of all the hunters, as well as group differences in valence.

Self versus Forest Ratings for Animals. Both Menominee and Euro-American hunters showed significant correlations between importance ratings for animals with respect to the self and to the forest (M average correlation: $r = 0.65$; EA average correlation: $r = 0.55$). The average difference between the two groups is not significant.

We can rule out the idea that Wisconsin hunters simply used their importance to self ratings when talking about the forest. They brought much ecological knowledge to bear on their responses that does not directly affect the importance to the self. The opposite is likely true too.

Summary: Familiarity and Importance Ratings

In many respects our findings on importance ratings are striking. Although both groups were more or less equally familiar with the plants and animals employed, there is a large main effect of cultural group in all ratings. Menominee hunters consistently gave higher overall ratings. However, in the case of the importance of animals to the self, the cultural differences only reach statistical reliability for nongame animals as a group but not for game animals. This is consistent with the idea that Menominee attribute value to all animals. Euro-American hunters, however, focus mainly on the value of game animals, the targets of their activity.

Justifications reveal that group differences derive from abstract principles and a variety of species-specific considerations. The abstract principle that many Menominee expressed is that every kind has a role in the life of the forest. This orientation also carried over into ratings of importance to self; a fair number of Menominees mentioned that if some plant or animal is important to the forest, then it is important to them. In comparison, Euro-American hunters were more likely to use a straightforward utility evaluation.

Both groups have a rich understanding of the forest, but overall similarities help highlight differences. Differences do not lead inevitably to intergroup conflict, although they might help explain it by illustrating some of the underlying perceptions. Differences are also in line with our ethnographic report of alternative epistemological frameworks and the fact that the Menominee forest management plan is concerned with the overall health of the forest rather than focusing on one or two important species.

In contrast, for Euro-American hunters there appears to be an increasing mismatch between their goals and proper forest management. Here, the attention of forest management is often reduced to a few or even a single species, in ways not compatible with overall forest health.

The data illustrate that the forest means much more to Menominee hunters than the game that is part of it. Many kinds have significance for cultural or religious reasons, medicinal or food value, or other forms of utility and meaning. Still, group differences in values of species are rather modest. Given our findings among fish experts (Medin et al. in press; Medin, Ross, Atran et al. 2006)

we suspect that the modest differences will be amplified when it comes to inter-group perceptions.

Study 2: Reported and Perceived Hunting Values

To understand group perceptions we conducted two separate interviews (participants overlapped only partly across the two tasks). In the first interview each participant was asked to rank order a set of goals, according to his personal reasons for hunting. The goals were selected from informal interviews with both Menominee and Euro-American hunters. Next, each hunter had to rate 21 hunting practices with respect to approval or disapproval.

In the second interview, carried out several weeks after the first, each hunter was provided with the same questions. However, this time each participant was asked to respond first from the perspective of hunters of his own community (in-group perception) and then from the perspective of hunters of the other community (out-group perception). At the end of the second interview, we showed each person the average group ratings from interview 1.

The first interview allowed us to explore group differences while setting up a baseline for exploring stereotyping. We define stereotyping as the difference between an informant's perception of a group's behavior compared with the mean of individual responses for each group. We contrast in-group (e.g., Menominees predicting Menominee average responses) and out-group stereotyping (e.g., Euro-American hunters predicting Menominee average responses).

Results on Values

Self-Reported Goals and Values. First, we consider the importance rankings for seven potential goals associated with hunting. These data are based on 14 majority-culture and 13 Menominee hunters. The goals and the mean rankings for both groups of hunters are shown in Table 5. Higher numbers correspond to greater importance. For both groups the most important goal was hunting as a means of being close to nature. For Menominee hunting to get a trophy-sized buck was the least important goal (their ratings are close to neutral), whereas the least important goal for Euro-American hunters was hunting as a source of food.

TABLE 5. Average of Individual Goal Rankings for Menominee and Euro-American Hunters

Hunting Goal	Menominee	Euro-American
Close to nature	5.7	5.0
Outsmart game	3.9	4.0
Source of food	4.6	2.4
Trophy	3.1	3.2
Get away from it all	3.2	4.9
Pass on to future	3.9	4.8
Doing as ancestors did	3.6	3.7

Note: Rankings have been inverted so that higher numbers reflect greater priority.

Across-group differences are statistically reliable for two of the goals. As anticipated, hunting as a source of food was more important for Menominee hunters than for Euro-American hunters.[28] The other main difference is that Euro-American hunters gave higher priority to hunting as a way to "get away from it all."[29] Menominee hunters often responded that they "*are* away from it all" by virtue of living in the Menominee forest. The difference in orientation toward trophy hunting is in the predicted direction, although not significant.

There was no reliable consensus either for the combined groups or for each group considered by itself. In part this reflects the mixed reactions (within each group) to at least one of the goals, hunting for a trophy-sized buck.

Values and Attitudes toward Practices. The approval–disapproval ratings for the 21 practices associated with hunting are summarized in Table 6. A consensus analysis reveals striking cross-group agreement and no group differences in first factor scores.[30] The general consensus is indicated by the +0.77 correlation of overall group mean ratings. This overall agreement is coupled with reliable group differences on the second factor scores, indicating group-specific submodels.[31]

Only Menominee approved of using dogs for hunting deer (this practice is illegal off the reservation). They were also more approving of hunting deer for food. However, they disapproved of shooting raccoons and squirrels for fun or shooting wolves, practices toward which Euro-American hunters had a neutral stance. Finally, Menominee hunters were less approving of using bait for hunting

TABLE 6. Mean Approval Ratings by Menominee and Euro-American Hunters for Hunting Goals and Practices

Hunting Goal–Practice	Menominee	Euro-American
Hunting for biggest buck	3.3	4.2
"Shining" deer	2.3	1.2
Hunting deer with bow and arrow	6.5	6.7
Baiting deer for gun hunting	3.7	3.6
Baiting deer for bow hunting	4.7	4.0
Hunting deer for food	6.7	5.9
Hunting bear for food	5.2	4.6
Baiting bear	4.0	5.9
Hunting with dogs for bear	4.5	4.0
Hunting with dogs for deer	5.4	1.7
Shooting wolves	1.8	3.6
Hunting turkey for food	6.4	5.8
Shooting raccoons or squirrels for fun	1.5	3.4
Exceeding Department of Natural Resources limit to feed family	3.8	4.5
Giving away game	4.3	4.1
Selling deer	1.4	1.9
Borrowing deer tag	2.7	3.6
Leaving beaver meat, taking only the pelt	4.3	4.4
Leaving a downed doe	1.1	1.1
Leaving bear meat, taking only the pelt	1.1	1.3
Taking only the tenderloin from a downed deer	1.0	1.0

Note: Larger numbers indicate greater approval. The ratings are based on a seven-point scale.

bear than their Euro-American peers. As mentioned above, several of our Menominee participants belong to the bear clan; for some of them, this means that they cannot kill a bear at all.

Statistical tests support essentially all of these observations, yet these differences are modest compared with the overall agreement. Hunters of both groups condemned shining deer, leaving a doe that has been shot, taking a bear hide and leaving the meat, selling deer, and shooting a deer and taking only the tenderloin. They were also in general agreement on methods of hunting. We were interested whether this cross-group agreement would prevent out-group stereotyping.

Results on Stereotyping

Predicting One's Own Group and the Other Group. Recall, in this interview hunters were asked to predict how fellow hunters of their own or the other group would answer these questions. There was less than a 50 percent overlap between the participants who did the individual ratings and the sample that made predictions about their own and the other community.

The prediction data are quite rich, and we will approach them from different angles. First, we ask how well members of each group perceived their own group. Second, we look at how accurately values of the other group were perceived. Our standard of accuracy is the mean ratings by individual group members just described.[32]

Accuracy of Predicted Goals. As expected from the lack of consensus on individually reported goals, we did not find consensus with respect to predictions either. The results do not allow for a clear interpretation of the data. The specific values and attitudes toward practices are considerably more informative.

Accuracy of Predicted Value Ratings. The critical data are summarized in Table 7. It shows the mean estimates for one's own group and for the other group. We have included the individual means from Table 6 for comparison.

Perspectives on Euro-American Hunters. In this set of analyses we compared the individual Euro-American means with (1) Euro American in-group perceptions and (2) Menominee out-group perceptions. We performed a combined cultural consensus analysis of the three sets of data associated with the right half of Table 7.

Overall, we find a strong consensus (although one Menominee had a slightly negative first factor loading) coupled with systematic differences.[33] Looking at the first factor scores, we find that Euro-American ratings for themselves do not differ significantly from estimates for their group as a whole. Both sets of Euro-American ratings have reliably higher first factor scores than Menominee ratings of Euro-American hunters (EA individual mean = 0.77 and EA predicting EA = 0.81 vs. M predicting EA = 0.60).[34] The same group differences are also evident for second factor scores, where, again, Menominee raters differed reliably from the two other sets of ratings, which do not differ from one another.[35]

TABLE 7. Predicted Approval Ratings by Menominee and Euro-American Hunters for Hunting Goals and Practices

Hunting Goal–Practice	M/M	M Mean	EA/M	EA/EA	EA Mean	M/EA
Hunting for biggest buck	3.2	3.3	4.7	4.6	4.2	5.9
"Shining" deer	2.7	2.3	5.6	1.1	1.2	1.7
Hunting deer with bow and arrow	6.3	6.5	4.5	6.3	6.7	6.7
Baiting deer for gun hunting	4.2	3.7	5.2	3.8	3.6	5.5
Baiting deer for bow hunting	4.7	4.7	5.4	4.7	4.0	5.8
Hunting deer for food	6.9	6.7	6.3	5.9	5.9	5.1
Hunting bear for food	5.3	5.2	5.6	4.1	4.6	4.0
Baiting bear	4.3	4.0	6.1	6.5	5.9	4.8
Hunting with dogs for bear	3.8	4.5	6.6	4.4	4.0	4.7
Hunting with dogs for deer	4.9	5.4	6.4	1.5	1.7	1.7
Shooting wolves	1.5	1.8	4.6	3.4	3.6	2.5
Hunting turkey for food	6.3	6.4	5.5	6.0	5.8	6.0
Shooting raccoons or squirrels for fun	2.3	1.5	4.4	3.2	3.4	4.1
Exceeding Department of Natural Resources limit to feed family	4.2	3.8	6.3	3.6	4.5	3.7
Giving away game	4.1	4.3	4.2	3.8	4.1	3.5
Selling deer	1.8	1.4	4.6	1.4	1.9	2.3
Borrowing deer tag	4.0	2.7	5.6	4.1	3.6	4.9
Leaving beaver meat, taking only the pelt	2.9	4.3	4.4	4.6	4.4	5.0
Leaving a downed doe	1.1	1.1	3.4	1.1	1.1	3.1
Leaving bear meat, taking only the pelt	1.0	1.1	2.7	1.4	1.3	2.9
Taking only the tenderloin from a downed deer	1.1	1.0	2.5	1.1	1.0	2.7

Note: M = Menominee; EA = Euro-American. Ordered from the predicting group to the predicted group (e.g., EA/M = Euro-American predictions of Menominee responses). Mean individual ratings from Table 6 are repeated here for ease of reference. Larger numbers indicate greater approval. The ratings are based on a seven-point scale.

Euro-American hunters perceived their own group accurately. Menominee predicted Euro-American hunters' values fairly well, but at an accuracy rate below the Euro-American hunters' self-perceptions. Specifically, Menominee overestimated the approval given by majority-culture hunters for the following practices:

1. Going for the biggest buck
2. Baiting deer for gun hunting

3. Baiting deer for bow hunting
4. Shooting a doe and leaving it on the ground
5. Shooting a bear for its fur and leaving the meat
6. Taking only the tenderloin from a deer and leaving the rest of the meat[36]

Clearly, Menominee stereotyped Euro-American hunters as being trophy oriented, willing to use bait, and uninterested in the meat, per se. Yet these stereotypes are minimal compared with Euro-American stereotyping about Menominee values, a topic we turn to now.

Perspectives on Menominee Hunters. The same analysis was performed again, this time comparing individual Menominee reported values with (1) Menominee in-group predictions and (2) Euro-American hunters' out-group predictions. Compared with the previous analysis we find a considerably weaker consensus across the three sets of data.[37] Given that two Euro-American hunters had negative first factor scores, one might even argue that the data represent at best a marginal consensus. We find consensus for each data set individually, suggesting that at least one set of data is reliably different from the other two. Univariate analysis reveals significant group differences on first factor scores. Looking at the distribution of first and second factor loadings, a similar (but reversed) pattern as described for Euro-American values appears: First factor scores for Menominee's perceptions of their own group do not differ significantly from their self-ratings (M predicting M = 0.67 vs. M individual mean = 0.79), but both differ significantly from the first factor scores for Euro-American hunter ratings of Menominee values (EA predicting M = 0.39).[38] The same distribution is found for the second factor scores.[39] Given the consensus data, it is not surprising that we do not find a single case for which the difference between Menominee self-rating and Menominee rating of their peers' values differ significantly.

Again, in-group predictions of values are fairly accurate, whereas Euro-American hunters showed very substantial out-group stereotyping. They overestimated (in the case of bow hunting, underestimated) Menominee's approval for quite a few probes:

1. Shining deer
2. Bow hunting deer

3. Using bait for gun hunting deer
4. Baiting bear
5. Using dogs to hunt bear
6. Shooting wolves
7. Shooting raccoons and squirrels for fun
8. Taking more than one's limit to feed one's family
9. Selling deer
10. Filling out some else's tag
11. Shooting a doe and leaving it
12. Taking a bear hide and leaving the meat
13. Shooting a deer and taking only the tenderloin[40]

The length of the list is striking. However, we hasten to add that we only find marginal consensus with respect to majority-culture hunters' perception of Menominee attitudes. This does not do away with existing stereotypes and misconceptions, but it does show that not all Euro-Americans buy into stereotypes to the same degree. Therefore, it is instructive to explore within-group differences in more detail.

Who Has Stereotypes? There are large individual differences in the magnitude of stereotyping, with several hunters in each group showing no evidence of any prejudice. To test the extent of stereotyping, we developed an index of stereotyping for each group to look for patterns internal to the ranking and rating tasks. Our index was based on predicted out-group minus predicted in-group ratings, for example, a person's perceived difference of in-group and out-group values with respect to the 13 practices listed just above. One can suggest adding or deleting one or another item from our list of stereotype-relevant probes, but the general picture would not change.

For Menominee hunters we could not detect any meaningful correlate that would predict Menominees' stereotyping of Euro-American hunters. However, with respect to Euro-American hunters, the more an individual predicted that his fellow Euro-American hunters would endorse the goal of hunting for food, the *less* stereotyping he showed of Menominee hunters ($Rxy = -0.52$, $p < .03$ by a directional statistical test).

This finding indicates that agreement with Menominee goals (here hunting for food) tends to correlate with less stereotyping. More research is needed to confirm this pattern, yet we have evidence for a similar effect among Menominee and majority-culture fish experts.

General Discussion

In this article we have documented a case of intergroup conflict over resources that is apparently not driven by differences in values. Why do we call the situation a conflict? There is a big debate in the Midwest about the rights of Native Americans with respect to hunting and fishing. This debate has received a lot of media attention, especially in cases of violent outbreaks. The notion of Native Americans having special rights and, worse yet, depleting a common resource is stuck in many Euro-American sportsmen's minds. By contrast Menominee perceive Euro-American interests in hunting as wasteful, undermining the integrity of the environment.

Four major findings from related studies with fish experts are relevant. First, Menominee and Euro-American fish experts share basic knowledge about the domain of freshwater fish (Medin, Ross, Atran et al. 2006). Second, experts of both groups show reliable differences with respect to the organization of this knowledge. For Menominee we have found that the epistemological framework of "everything is interdependent and has a role to play" influences their perception of freshwater fish ecology. Third, despite the overall agreement in knowledge and basic values, we found massive stereotyping among Euro-American fish experts with respect to Menominee fishermen's values and practices. Fourth and finally, stereotyping of Menominees by Euro-American fishermen showed individual differences—the more similar a majority-culture fisherman's goals and values were to Menominee values, the less stereotyping we observed (Medin et al. in press).

In this article we document the same pattern for the domain of hunting. This provides confirmation of our main arguments: First, intergroup conflict can thrive despite the lack of significant differences in actual group values and practices; second, different models of the environment, or what we call epistemological frameworks, are linked to stereotyping and conflict. Overall, the results are not encouraging, at least with respect to intergroup perceptions.

Menominee hunters show moderate stereotyping of Euro-American values, and Euro-American hunters show extensive stereotyping of Menominee values.

Actual values for the two groups are substantially more similar than perceived values. Given the attention to trophy game in sporting magazines, it is perhaps not surprising that Menominee hunters think of Euro-American hunters as trophy hunters, paralleling the Euro-American model of fishing as a sport with the associated ethic of "fair chase."

One aspect of the Wisconsin state curriculum for hunter education is of special interest here. In this manual one can find ten diagrams and drawings of deer in the sections leading up to the discussion of hunter ethics. All ten representations are of adult bucks with healthy racks. So there is at least the implicit message that bucks are what deer hunting is about. The drawings of hunters include women and minorities, but apparently it is still not "politically correct" to shoot does, at least as judged by the artistic renditions.

Euro-American misperceptions of Menominee are mainly driven by differences in attitudes toward practices, such as shining deer and using dogs to hunt. In addition they make the wrong inferences from specific observations. Many Euro-Americans deduce from their belief that Menominee shine, use dogs to hunt deer, and hunt for food that deer must be scarce on the reservation. This belief is reinforced by the fact that one observes many fewer deer on the reservation than in the surrounding counties. As we have stressed, however, this difference in density of deer population owes to limits imposed by the different ecological conditions (carrying capacity) and better deer management.

The positive result of our study is that we find a lot of variability in stereotyping. In fact, many Menominee and some Euro-Americans show no stereotyping whatsoever. Stereotyping of Menominee decreases as similarity between an individual majority-culture person's goals and Menominee goals increases—similar understandings of the environment and similar goals lead to similar evaluations of specific activities. For most of our Euro-American participants the forest may represent a "container of species" with specific values. In this scenario humans cease to interact with the environment—instead, they act on it. One might think that a shift in Wisconsin state forest management, now focused almost solely on deer hunting, to a more holistic forest management policy would likely change interpretations of observations and hence

stereotyping. Nothing indicates that the Euro-American views and goals for hunting will shift any time soon.

Finally, a word on culture and methods. In this study we have shown how moving beyond a concept of culture based on shared norms, ideas, and values is important for an understanding of human behavior. Rather than treating agreement as a cultural norm and disagreement as noise, we propose a focus on both disagreement and agreement, for exploring both the origins and consequences of intragroup as well as intergroup differences.

NORBERT ROSS is Associate Professor of Anthropology and Psychology at Vanderbilt University

DOUG MEDIN is Professor of Psychology and of Education at Northwestern University

DOUG COX is Forest Ecologist for Menominee Tribal Enterprises on the Menominee reservation in Wisconsin

Notes

1. The story of the Spirit Rock is the story of a hunter who, granted a wish by the gods, showed selfish pride by asking for eternal life. He was granted the wish by being converted into a stone. Legend has it that when Spirit Rock disappears the Menominee will no longer exist as a people.

2. Although this article deals mainly with hunting, it is important to note that most Wisconsin hunters also fish and their perceptions about fishing color their perceptions about hunting and vice versa.

3. Whether the legal and illegal baiting of deer is sufficient to prevent overgrazing of forest plants is an open question.

4. Renewal of gaming compacts for tribal casinos is frequently the occasion for state governments to pressure tribes to give up their treaty-based hunting and fishing rights (Milwaukee Journal Sentinel 1999; Tracy 1998). In the words of a Wisconsin state legislator, "The tribes should determine what is more important to them—fish or chips" (Beloit Daily News 1997).

5. Callicott and Nelson (2004) describe the environmental ethics of Ojibwa, another Algonquin-speaking group of Native Americans. Some of what these authors describe as "cultural worldview" (2004:6) captures our understanding of epistemological frameworks.

6. That hunting for sport and trophy alone is disrespectful to the animal is not an idea unique to the Menominee. See the collection of Ojibwa stories presented and discussed by Callicott and

Nelson (2004) that express a very similar value of hunting—an exchange between "other than human persons" and humans. Here, killing an animal without need is an insult to the animal.

7. Above we argued that Euro-American hunters have strong stereotypes about Menominee hunters, yet the data make it clear that stereotyping among them is distributed in nonrandom ways.

8. Based on each individuals' participation in the consensus (the first factor score) we are able to test whether pairs of individuals agree more with one another in reality (raw agreement score) than what would be predicted by their participation in the consensus (predicted agreement score, the product of the two individuals' first factor scores). This analysis of "residual agreement" allows us to test for systematic differences within a consensus (see Ross 2004 for an elaboration of this method).

9. For Menominee we found very little stereotyping with no clear relations to other domains within our study.

10. We asked approximately 40 individuals for experts. Although we encountered many women expert hunters or fishers, no woman was ever nominated as an expert.

11. $F = 5.5$, Mse = 1.23, $p = .025$; $F = 3.6$, Mse = 0.86, $p = .06$.

12. $F = 3.92$, Mse = 0.75, $p = .058$.

13. $F = 6.8$, Mse = 1.3, $p = .015$; $F = 4.3$, Mse = 0.49, $p = .046$.

14. $F = 18.5$, Mse = 8.7, $p < .001$.

15. $F = 17.3$, Mse = 13.1, $p < .001$.

16. Elm dies readily and serves both as a nurse log for animals and as firewood for Menominee. Blackberries are a pleasant source of food for people and animals alike, and the reservation has lots of them. White birch was used in the past by Menominee for canoes and is still used in basketry. It also provides shade or cover for other plants to grow. Ginseng is collected by Menominee as a medicinal plant and either used or sold. Sumac is used by Menominee in pipes, for fishing poles, and as a medicine. Chokecherries are used in jams. Red maple is an excellent wood for furniture and floors.

17. $F = 5.88$, Mse = 8.3, $p < .05$; $F = 35.4$, Mse = 21.6, $p = .000$.

18. Ratio of first to second factor = 3.6 to 1; first factor explains 44 percent of the variance; average first factor score = 0.63.

19. We find higher agreement for Euro-American (Ratio of first to second factor = 4.3 to 1, first factor explains 54 percent of the variance, average first factor score = 0.73) than for Menominee (ratio of first to second factor = 3.2 to 1, first factor explains 40 percent of the variance, average first factor score = 0.61).

20. $F = 8.1$, Mse = 1.61, $p < .01$; R-square = 0.26, $F = 4.53$, Mse = 3.7, $p = .02$; coefficient for hunting Beta = 0.455, $t = 2.7$, $p = .012$.

21. $F = 7.6$, Mse = 6.4, $p = .01$.

22. *R*-square = 0.43, $F = 9.7$, Mse = 10.8, $p = .001$; coefficient for hunting Beta = 0.510, $t = 3.4$, $p = .02$; coefficient for life-form Beta = 3.75, $t = 2.5$, $p = .018$.

23. $F = 5.5$, Mse = 8.6, $p = .02$.

24. $F = 10.9$, Mse = 14.6, $p = .003$.

25. $F = 7.7$, Mse = 8.2, $p = .008$.

26. The higher Menominee ratings also appear to have been influenced by utility and cultural significance. Wolf and bear are Menominee clans, and turtle is a major subclan. Porcupines are still used for quillwork, and parts of otter and beaver are used in making tribal regalia. Turtles and bears are a source of food, and bear parts have a number of uses including medicinal. In earlier times every mammal whose pelt was taken was also a source of food.

27. Lower-than-midpoint ratings indicate that an animal is seen as an actual negative. Note that for Menominee these numbers exclude the individuals who gave the highest ratings for all animals. If we count their responses, no animal received a below-midpoint rating.

28. Aver: M = 5.6 versus EA = 3.4; $F = 10.8$, Mse = 33.2, $p = .003$.

29. Aver: EA = 5.8 versus M = 4.1; $F = 5.0$, Mse = 19.5, $p = .034$.

30. Ratio of first to second factor = 4.5 to 1; first factor explains 52.3 percent of the variance; average first factor score = 0.71.

31. $F = 28.4$, Mse = 1.6, $p = .000$.

32. Obviously self-reports are not necessarily the best way to understand real practices of individuals. However, we are interested in stereotyping of in-group–out-group behavior, and for this matter self-reports are a good starting point. In addition, over the years we established very good rapport with our research participants, to the extent that some of them would even report the illegal behaviors they engage in.

33. Ratio of first to second factor = 6.0 to 1; first factor explains 57.2 percent of the variance; average first factor score = 0.72.

34. $F = 5.1$, Mse = 0.192, $p = .01$.

35. $F = 18.1$, Mse = 0.975, $p = .000$.

36. The respective statistical results are as follows: (1) $F = 7.8$, Mse = 20.6, $p = .009$; (2) $F = 13.6$, Mse = 27.8, $p = .001$; (3) $F = 11.4$, Mse = 24.2, $p = .002$; (4) $F = 14.4$, Mse = 28.6, $p = .001$; (5) $F = 6.6$, Mse = 19.6, $p = .016$; and (6) $F = 12.2$, Mse = 20.0, $p = .002$.

37. Ratio of first to second factor = 3.3 to 1; first factor explains 40.8 percent of the variance; average first factor score = 0.58.

38. $F = 12.4$, Mse = 0.57, $p = .000$; post hoc tests: Menominee self versus Euro-American ratings for Menominee, $p = .000$; Menominee group ratings for Menominee versus Euro-American ratings for Menominee, $p = .000$.

39. $F = 16.3$, Mse = 1.1, $p = .000$; post hoc tests: Euro-Americans' versus Menominee self, $p = .000$; Euro-American versus Menominee group ratings, $p = .000$.

40. The respective statistical results are as follows: (1) $F = 23.4$, Mse = 74.9, $p = .000$; (2) $F = 12.1$, Mse = 25, $p = .002$; (3) $F = 5.2$, Mse = 14.8, $p = .03$; (4) $F = 12.0$, Mse = 30.9, $p = .002$; (5) $F = 14.7$, Mse = 32.0, $p = .001$; (6) $F = 18.9$, Mse = 55.6, $p = .000$; (7) $F = 21.6$, Mse = 59.3, $p = .000$; (8) $F = 13.1$, Mse = 40.1, $p = .001$; (9) $F = 25.5$, Mse = 66.8, $p = .000$; (10) $F = 19.8$, Mse = 58.6, $p = .000$; (11) $F = 12.5$, Mse = 34.6, $p = .002$; (12) $F = 7.8$, Mse = 18.0, $p = .01$; and (13) $F = 6.2$, Mse = 14.5, $p = .019$.

References Cited

Atran, Scott, Doug Medin, Norbert Ross, Elizabeth Lynch, John Coley, Edilberto Ucan Ek', and Valentina Vapnarsky
1999 Folkecology and Commons Management in the Maya Lowlands. Proceedings of the National Academy of Sciences USA 96:7598–7603.

Atran, Scott, Doug Medin, Norbert Ross, Elizabeth Lynch, Valentina Vapnarsky, Edilberto Ucan Ek', John Coley, Christopher Timura, and Michael Baran
2002 Folkecology, Cultural Epidemiology, and the Spirits of the Commons: A Garden Experiment in the Maya Lowlands, 1995–2000. Current Anthropology 43(3):421–450.

Basso, Keith
1996 Wisdom Sits in Places: Landscape and Language among the Western Apache. Albuquerque: University of New Mexico Press.

Beck, David
2002 Siege and Survival: History of the Menominee Indians, 1634–1856. Lincoln: University of Nebraska Press.

Beloit Daily News
1997 Petition Seeks to Separate Spearfishing, Gaming. 23 October. Electronic document, http://www.beloitdailynews.com/1097/4wis23htm, accessed September 13, 2007

Bobo, Lawrence, and Mia Tuan
2006 Prejudice in Politics. Cambridge, MA: Harvard University Press.

Boster, James
1987 Introduction. Special issue, "Intercultural Variation," American Behavioral Scientist 31(2):150–162.

Callicott, Baird, and Michael Nelson
2004 American Indian Environmental Ethics: An Ojibwa Case Study. Upper Saddle River, NJ: Prentice Hall.

Davis, Thomas
2000 Sustaining the Forest, the People, and the Spirit. Albany: State University of New York Press.

Keesing, Felix M.
1987[1939] The Menomini Indians of Wisconsin: A Study of Three Centuries of Cultural Contact and Change. Philadelphia: American Philosophical Society.

Kempton, Willet, James Boster, and Jennifer Hartley
1995 Environmental Values in American Culture. Cambridge, MA: MIT Press.

Medin, Doug, Elizabeth Lynch, John Coley, and Scott Atran
1997 Categorization and Reasoning among Tree Experts: Do All Roads Lead to Rome? Cognitive Psychology 32(1):49–96.
Medin, Doug, Norbert Ross, Scott Atran, Russ Burnett, and Sergey Blok
2002 Categorization and Reasoning in Relation to Culture and Expertise. *In* The Psychology of Learning and Motivation, vol. 41. B. Ross, eds. Pp. 1–41. New York: Academic.
Medin Doug, Norbert Ross, Scott Atran, Doug Cox, John Coley, Julia Proffitt, and Sergey Blok
2006 Folkbiology of Freshwater Fish. Cognition 99:237–273.
Medin, Doug, Norbert Ross, and Doug Cox
2006 Culture and Resource Conflict: Why Meanings Matter. New York: Russell Sage.
Medin, Doug, Norbert Ross, Doug Cox, and Scott Atran
In press Why Folkbiology Matters: Resource Conflict despite Shared Goals and Knowledge. Human Ecology.
Milwaukee Journal Sentinel
1999 Tribal Claims Were Too Much. 25 April. Electronic document, http://www.jsonline.com/news/editorials/apr99/0425tribal.asp, accessed September 13, 2007
Nakao, K., and Kimball Romney
1984 A Method for Testing Alternative Theories: An Example from English Kinship. American Anthropologist 86:668–673.
Pecore, Marshall
1992 Menominee Sustained Yield Management. Journal of Forestry 90:12–16.
Romney, Kimball, Susan Weller, and William Batchelder
1986 Culture as Consensus: A Theory of Culture and Informant Accuracy. American Anthropologist 88:318–338.
Ross, Norbert
1997 Ökologie und Religion; einige methodische und theoretische Überlegungen zu einem kognitiven Ansatz (Ecology and religion: Some thoughts on method and theory of a cognitive approach). *In* Religionsethnologische Beiträge zur Amerikanistik (Papers in the anthropology of religion of the Americas). E. Dürr and S. Seitz, eds. Pp. 177–192. Münster: LIT-Verlag.
2002 Cognitive Aspects of Intergenerational Change: Mental Models, Cultural Change, and Environmental Behavior among the Lacandon Maya of Southern Mexico. Human Organization 61:125–138.
2004 Culture and Cognition: Implications for Theory and Method. Thousand Oaks, CA: Sage Publications.
Tracy, L.
1998 State Trends. Council of State Governments Newsletter, Summer 1998. Electronic document, http://stars.csg.org/trends/1999/summer/su99st7.pdf, accessed September 13, 2007.
White, Lynn
1967 The Historical Roots of Our Environmental Crisis. Science 155:1203–1207.