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## Peer-Reviewed Articles

# Patterns of Wildlife Value Orientations in Hunters' Families

**HARRY C. ZINN**

The Pennsylvania State University
University Park, Pennsylvania, USA

**MICHAEL J. MANFREDO**

Colorado State University
Fort Collins, Colorado, USA

**SUSAN C. BARRO**

USDA Forest Service

*Public value orientations toward wildlife may be growing less utilitarian and more protectionist. To better understand one aspect of this trend, we investigated patterns of wildlife value orientations within families. Using a mail survey, we sampled Pennsylvania and Colorado hunting license holders 50 or older, obtaining a 54% response rate* (n = *599). Males (94% of sample) reported their own basic beliefs about wildlife and perceptions of the basic beliefs of their mothers, fathers, spouses, oldest sons, and oldest daughters. A majority approved of wildlife use and hunting but not wildlife rights. Males were least likely to perceive differences between their own beliefs and those of their fathers and sons and most likely to perceive differences between their own beliefs and those of their daughters. Respondents who perceived most differences were likely to report moderate utilitarian value orientations and to have grown up in urban areas, lived in more than one state, and attended college. Results link values shifts to three current trends: urbanization, residential mobility, and increasing education. To the extent that wildlife value orientations are changing, wildlife management agencies must adapt to that change. Future studies should measure beliefs of multiple family members and use both quantitative and qualitative approaches to understanding values transmission.*

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Address correspondence to Harry C. Zinn, The Pennsylvania State University, Recreation and Park Management Program, 201 Mateer Building, University Park, Pennsylvania 16802, USA. E-mail: hzinn@psu.edu.

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Natural resource managers and researchers frequently observe that public expectations for resource management and resource-based recreation appear to be changing from a predominately utilitarian orientation toward a more protectionist orientation (e.g., Kempton, Boster, & Hartley, 1995; Muth & Jamison, 2000; Organ & Fritzell, 2000; Peterson & Manfredo, 1993). Formerly uncontroversial issues in wildlife management, forestry, and hydroelectric generation have become subject to contentious public debate, legal challenges, and ballot initiatives. The causes of this change are not fully understood. Some evidence suggests that U.S. society is undergoing a fundamental shift away from utilitarian value orientations toward more protectionist value orientations (e.g., Inglehart, 1997; Manfredo & Zinn, 1996). This shift may be related to changes in the ethnic makeup and age structure of society (Dwyer, 1994; Murdock, 1995) and/or urbanization and changes between generations (Manfredo & Zinn, 1996).

If value orientations are changing between generations, one step in understanding that change will be learning more about patterns of value orientations within family groups and variables that may be related to these patterns. This study was designed to describe perceived patterns of value orientations within families and test for relationships among these patterns and sociodemographic characteristics.

## Conceptual Background

This study builds on the conceptual approach to value orientations introduced by Kluckholn (1951) and first applied to human thinking about wildlife by Fulton, Manfredo, and Lipscomb (1996). In this approach, wildlife value orientations are comprised of basic beliefs about human relationships with wildlife, including basic beliefs about wildlife use, wildlife rights, and hunting. Wildlife value orientations have been conceptualized as ranging along a bipolar continuum from a strongly utilitarian value orientation (endorsing human use and manipulation of wildlife) to a strongly protectionist value orientation (opposing human use and manipulation of wildlife and endorsing human protection of wildlife).

Value orientations give meaning and organization to an individual's core values, linking them to a wide array of specific attitudes and behaviors. Unlike core values, which are typically too broad to predict specific attitudes and behaviors (Kristiansen & Hotte, 1996; Schwartz, 1996), wildlife value orientations predict attitudes toward hunting and fishing (Fulton et al., 1996) attitudes toward wildlife management activities (Zinn, Manfredo, Vaske, & Wittmann, 1998), responses to potentially dangerous wildlife (Zinn & Pierce, 2002), and orientation toward political issues (Bright, Manfredo, & Fulton, 2000). Focusing on wildlife value orientations rather than basic human values increases the possibility of detecting differences between generations and identifying variables related to these differences.



Theorists agree that human beings construct personal values by interpreting the values and behavior of others (Kuczynski & Grusec, 1997). Values are likely to be shaped by interaction with a variety of individuals and social institutions (Garbarino, Kostelny, & Barry, 1997; Smetana, 1997), but considerable evidence suggests that parents (or other primary caregivers) typically are among the most important sources of values information for their children and that patterns of values within family groups are usually similar (Grusec & Kuczynski, 1997; Rohan & Zanna, 1996).

Although causal relationships are not clear, research suggests that the degree of similarity between parent and child value orientations may be associated with level of formal education, rural versus urban residence, and residential stability. In a longitudinal series of multinational general population surveys, both increasing education and urbanization were found to be inversely related to traditional utilitarian values (Inglehart, 1997). Similarly, urban residence was found to be inversely related to traditional utilitarian value orientations in two cross-sectional samples of the general population of Colorado (Manfredo & Zinn, 1996). In contrast, residential stability, or length of time living in one area, has been found to be positively related to traditional utilitarian values (Vaske, Donnelly, Williams, & Jonker, 2001).

In addition, both actual and perceived differences in value orientations within families may be related to the extremity of value orientations. Actual differences may occur because, compared to a parent with moderately held value orientations, a parent with strongly held value orientations may transmit his or her value orientations to a child more successfully (Rohan & Zanna, 1996). Perceived differences may occur because, compared to an individual with moderately held value orientations, an individual with strongly held value orientations may be more likely to project his or her own value orientations onto in-group members, thus, perhaps, overstating the similarity between the value orientations of self and other family members (Gross, Holtz, & Miller, 1995; Kruglaski & Mackie, 1990; Marks & Miller, 1985).

## Study Purpose and Hypotheses

As one step toward a more complete understanding of possible shifts in wildlife value orientations, we designed this study to: (a) describe the wildlife value orientations of hunters old enough to have adult children; (b) examine perceived patterns of wildlife value orientations among respondents' family members; and (c) test for relationships between within-family patterns of wildlife value orientations and participant characteristics.

We chose to study hunters and their families because we wanted to capture a sample with traditional, utilitarian value orientations toward wildlife and research suggests that a high percentage of hunters express utilitarian wildlife value orientations (Fulton et al., 1996). We measured respondents' own wildlife value orientations and their perceptions of the wildlife value orientations of their spouses, parents, and adult children. This approach made it possible to describe perceived value orientations among members of three generations and test relationships between patterns of value orientations and other variables.

We hypothesized that participant perceptions of family differences in wildlife value orientations would be positively associated with (1) years of formal education, (2) urban upbringing, and (3) urban residence as an adult. Conversely, we hypothesized that participant perceptions of family differences in wildlife value orientations would be negatively associated with (4) residential stability and (5) extremity of participant's own wildlife value orientations.

## Methods

### *Study Population and Survey Procedures*

To ensure that study respondents were old enough to have at least one adult child, we chose to sample hunting license holders who were 50 years old or older at the time of the study. We sent up to three mailings (Baker, Absher, Knopf, & Virden, 2000; Dillman, 1978) to a random sample of resident hunting license holders obtained from wildlife management agencies in Pennsylvania and Colorado. Potential respondents were first mailed a questionnaire, a postage-paid return envelope, and a personalized cover letter explaining the study and requesting their participation. Ten days later, a reminder/thank you postcard was sent to each participant. Twenty days after the first mailing, a new cover letter and replacement questionnaire were sent to each participant whose original questionnaire had still not been returned.

Initially, we mailed 600 questionnaires in each state. In Pennsylvania, 27 questionnaires were undeliverable and 315 were returned, resulting in a net response rate of 55%. In Colorado, 55 questionnaires were undeliverable and 284 were returned, for a net response rate of 52%. Overall, 599 questionnaires were returned, and the net response rate was 54%. We judged the sample size adequate to test relationships between the psychological and sociodemographic variables of interest, and we did not conduct any tests of nonresponse bias.

### *Variables and Measurement*

*Respondents' wildlife value orientations.* We measured respondents' wildlife value orientations using an index comprised of nine items addressing basic beliefs about wildlife use, wildlife rights, and hunting (e.g., Fulton et al, 1996; Zinn et al., 1998). Participants responded to each item on a 7-point bipolar scale ranging from +3 (strongly agree) to –3 (strongly disagree). Index scores also ranged from +3 (extremely utilitarian) to -3 (extremely protectionist) and exhibited acceptable internal consistency (Cronbach's coefficient $\alpha = .72$).



*Respondents' perceptions of family members' basic beliefs about wildlife.* We also measured respondents' perceptions of the basic beliefs of up to six different people (self, spouse, mother, father, and two oldest children). To reduce the response burden posed by asking about the beliefs of six different individuals, we used a single item for each basic belief domain: (a) wildlife use – Wildlife populations should be used for human benefit; (b) wildlife rights – Wild animals should have rights similar to the rights of people; and (c) hunting – Hunting is a positive and humane activity. This created a battery of 18 items (3 domains × 6 persons). For responses to these items, we used an 11-point bipolar scale ranging from +5 (strongly agree) to –5 (strongly disagree). By using this scale for family comparisons, we allowed respondents to draw "fine" distinctions between themselves and other family members, distinctions that they might hesitate to make on a narrower 7-point scale. We made this change because we were concerned that a desire for social consistency might bias respondents toward understating (consciously or unconsciously) differences between their own basic beliefs and those of other family members (Gross, Holtz, & Miller, 1995; Kruglaski & Mackie, 1990; Marks & Miller, 1985).

*Sociodemographic variables.* We measured age and years of education as continuous variables and gender and ethnic background as categorical variables. We measured residential stability at the state level by asking how many years (total) respondents had lived in Pennsylvania or Colorado and dividing this value by their age. This created a proportion or ratio ranging from 0.0 (for a respondent who had lived in the state less than 1 year) to 1.0 (for a respondent who had lived in the state his or her entire life). To measure rural/urban differences, we used a similar approach. "Rural upbringing" was limited to place of residence from birth until age 17. To calculate the rural upbringing variable, the number of years (through age 17) that the respondent reporting living on a "farm, ranch, or rural area outside of a town" was divided by 17. Thus, the variable ranged from 0.0 (for a respondent who, through age 17, never lived on a farm, ranch, or rural area outside of a town) to 1.0 (for a respondent who, through age 17, always lived on a farm, ranch, or rural area outside of a town). "Rural residence as an adult" was defined as place of residence beginning at age 18. The number of years (beginning at age 18) that the respondent reporting living on a "farm, ranch, or rural area outside of a town" was divided by his or her age minus 17. This variable also ranged from 0.0 to 1.0.

## Results

### Profile of Respondents and Families

Respondents were 94% male and 95% Caucasian or White (not of Hispanic or Spanish origin). On average, respondents were 61 years old and had spent 50% of their youth (through age 17) and 35% of their adult lives in rural areas. They had spent an average of 80% of their lives residing in the state where they were surveyed. A total of 51% had attended some school beyond high school.

The fact that 94% of the survey respondents were males was consistent with the characteristics of hunters in this country (Brown, Decker, Siemer, & Enck, 2000), but it left us with fewer than 40 female respondents, a sample size we judged inadequate for conducting our statistical tests. For that reason, we included only male respondents in all subsequent analyses.

Of the 552 male respondents, 437 (79%) reported one or more basic belief scores for their mothers, and 423 (77%) reported one or more basic belief scores for their fathers. In comparison, 489 (87%) reported one or more basic belief scores for a spouse. A total of 456 male respondents (83%) reported one or more basic belief scores for a first (oldest) child (247 sons, 209 daughters), and 401 (73%) reported one or more basic belief scores for a second child (221 sons, 180 daughters).

### Patterns of Perceived Basic Beliefs Within Families

To examine patterns of perceived basic beliefs within the families of male respondents, we created up to 15 "perceived difference" scores for each participant, including five scores (self to mother, self to father, self to spouse, self to oldest son, self to oldest daughter) for each basic belief item (wildlife use, wildlife rights, hunting). We began our analysis of these perceived difference scores by conducting an omnibus test using mixed-model analysis of variance (Table 1). In this test, state (Pennsylvania, Colorado) was treated as a between-subjects factor. Basic belief domain (wildlife use, wildlife rights, hunting) and family member comparison (self to mother, self to father, self to spouse, self to oldest son, self to oldest daughter) were treated as within-subjects factors.

The results of the omnibus test demonstrated four things. First, basic beliefs about wildlife were not significantly different between Pennsylvania and Colorado respondents (Table 1), confirming that we could pool results from the two states for additional analysis. Second, basic beliefs were significantly different across domains. As expected, our sample of hunting license holders strongly endorsed wildlife use ($M = 3.09$) and hunting ($M = 4.45$), but did not endorse wildlife rights ($M = -1.78$). Third, respondents perceived significant differences between their own basic beliefs and those of other family members. Fourth, there was a significant interaction between belief domain and family comparison. In other words, the differences that respondents perceived between their own basic beliefs and those of other family members varied across the wildlife use, wildlife rights, and hunting items.



**TABLE 1** Patterns of Perceived Basic Beliefs Within Families: Summary Table for Mixed-Model Analysis of Variance with One Between-Subjects Factor and Two Within-Subjects Factors

| Source of variation | *df* | Adj. *df*[a] | *SS* | *MS* | *F* | *p* |
|---|---|---|---|---|---|---|
| Between subjects | | | | | | |
| Error between | 337 | — | 9,697.03 | 28.71 | — | — |
| State of residence (ST) | 1 | — | 9.56 | 9.56 | 0.33 | .565 |
| Within subjects | | | | | | |
| Error within (1) | 674 | 470 | 31,407.19 | 46.60 | — | — |
| Basic belief domain (BB) | 2 | 1 | 31,485.31 | 15,742.65 | 337.84 | < .001 |
| ST × BB | 2 | 1 | 244.16 | 122.08 | 2.62 | .074 |
| Error within (2) | 1,685 | 1,387 | 4,040.81 | 2.40 | — | — |
| Family member (FM) | 5 | 4 | 311.68 | 62.34 | 25.99 | < .001 |
| ST × FM | 5 | 4 | 7.90 | 1.58 | 0.66 | .655 |
| Error within (3) | 3,370 | 2,079 | 7,963.86 | 2.36 | — | — |
| BB × FM | 10 | 6 | 558.75 | 55.87 | 23.64 | < .001 |
| ST × BB × FM | 10 | 6 | 24.48 | 2.45 | 1.04 | .410 |

[a] Mauchly tests indicated that the assumption of sphericity for within-subjects effects was violated. Therefore, to assess the significance of the within-subjects factors (basic belief domain, family member) and all interactions involving these factors, we adjusted degrees of freedom downward using the Geisser-Greenhouse ε.

To better understand the results of the omnibus test, we examined more closely the scores reported by respondents for their own basic beliefs about wildlife as well as the scores they reported for other family members. Depending on family structure, we made up to 15 comparisons for each respondent (self to mother, father, spouse, oldest son, and oldest daughter × wildlife use, wildlife rights, and hunting). We found four patterns in these comparisons (Table 2). First, for each comparison, more than half of the respondents reported no difference between their own basic beliefs and those of other family members, regardless of basic belief item and regardless of family member. For example, 59% of the respondents reported no difference between their own beliefs and their mothers' beliefs about wildlife use; 69% reported no difference between their own beliefs and their mothers' beliefs about wildlife rights; and 58% reported no difference between their own beliefs and their mothers' beliefs about hunting.

Second, the responses exhibited a consistent pattern of perceived gender differences in family members' basic beliefs (Table 2). For each basic belief item,

**TABLE 2** Male Respondents' Perceptions of Other Family Members' Basic Beliefs About Wildlife in Comparison to Their Own Basic Beliefs

| Family member | Perceived belief relative to respondent's own belief | Basic belief domain | | |
|---|---|---|---|---|
| | | Wildlife use (%)[a] | Wildlife rights (%)[a] | Hunting (%)[a] |
| Mother | Less favorable | 33.2 | 13.3 | 40.4 |
| | No difference | 59.0 | 68.6 | 57.7 |
| | More favorable | 7.8 | 18.0 | 1.9 |
| Father | Less favorable | 15.1 | 15.1 | 15.0 |
| | No difference | 73.8 | 77.6 | 79.2 |
| | More favorable | 11.1 | 7.2 | 5.7 |
| Spouse | Less favorable | 29.0 | 6.0 | 36.7 |
| | No difference | 68.5 | 77.0 | 62.1 |
| | More favorable | 2.5 | 17.0 | 1.2 |
| Oldest son | Less favorable | 13.4 | 7.0 | 14.1 |
| | No difference | 81.9 | 80.8 | 83.3 |
| | More favorable | 4.7 | 12.2 | 2.6 |
| Oldest daughter | Less favorable | 45.1 | 7.2 | 45.9 |
| | No difference | 51.3 | 64.4 | 52.6 |
| | More favorable | 3.6 | 28.4 | 1.5 |

[a] Percent of respondents reporting that family members' belief was less favorable, no different, or more favorable than his own belief.

the male respondents' own beliefs were more likely to match those of their fathers and oldest sons than those of their mothers, spouses, and oldest daughters.

Third, respondents perceived the basic beliefs of their oldest daughters to be least similar to their own (Table 2). Only 51% of the respondents reported no difference between their own beliefs and their oldest daughters' beliefs about wildlife use; 64% reported no difference between their own beliefs and their oldest daughters' beliefs about wildlife rights; and 53% reported no difference between their own beliefs and their oldest daughters' beliefs about hunting.

Furthermore, respondents' perceptions of the basic beliefs of their oldest daughters were more asymmetrical than their perceptions of the basic beliefs of other family members (Table 2). Only 4% of the respondents perceived that their oldest daughters were more favorable toward wildlife use than themselves, but 45% perceived that their oldest daughters were less favorable toward wildlife use. Similarly, only 2% of the respondents perceived that their oldest daughters were more favorable toward hunting than themselves, but 46% perceived that their oldest daughters were less favorable toward hunting. Logically, the pattern regarding wildlife rights was reversed. Only 7% of the respondents perceived that their oldest daughters were less favorable toward wildlife rights than themselves, but 28% perceived that their oldest daughters were more favorable toward wildlife rights.



The fourth pattern involved the high level of perceived agreement between respondents and their oldest sons. For each basic belief, at least 80% of the respondents perceived no difference between self and oldest son (Table 2). However, perceived differences exhibited the same asymmetry found in the perceived differences between self and oldest daughter. Only 5% of the respondents perceived that their oldest sons were more favorable toward wildlife use than themselves, but 13% perceived that their oldest sons were less favorable toward wildlife use. Similarly, only 3% of the respondents perceived that their oldest sons were more favorable toward hunting than themselves, but 14% perceived that their oldest sons were less favorable toward hunting. In contrast, only 7% of the respondents perceived that their oldest sons were less favorable toward wildlife rights than themselves, but 12% perceived that their oldest sons were more favorable toward wildlife rights.

### *Hypothesized Predictors of Perceived Differences in Basic Beliefs*

After comparing respondents' own basic beliefs about wildlife to their perceptions of the basic beliefs of other family members, we tested our hypotheses about characteristics that may be associated with respondents' perceptions. Did level of education, rural–urban differences, residential stability, or extremity of individual wildlife value orientations predict the extent to which respondents perceived differences between their own basic beliefs and those of others family members?

To test our hypotheses, we created a new variable that allowed us to divide respondents into two groups, one group that perceived fewer differences in basic beliefs among family members and another group that perceived more differences in basic beliefs among family members. We divided the number of self-other differences perceived by each participant (regardless of magnitude or direction) by the total number of valid self-other comparisons made for each participant to create a proportion ranging from 0.0 (a participant who perceived no differences between self and other family members) to 1.0 (a participant who perceived differences between self and every other family member). Then, by applying a median split to this variable (median = 0.225), we created a "similar basic beliefs" group and a "dissimilar basic beliefs" group. This allowed us to test the relationship between membership in the similar/dissimilar basic beliefs groups and participant characteristics.

Using logistic regression, we tested the ability of five participant characteristics (education, rural upbringing [proportion of youth spent in a rural area], rural residence as adult, residential stability [proportion of life spent in state], and extremity of personal wildlife value orientation) to predict whether a participant was a member of the similar basic beliefs group or the dissimilar basic beliefs group. The logistic regression model was significant at the .001 level and ex-

**TABLE 3** Predictors of Membership in Similar or Dissimilar Basic Beliefs Group: Logistic Regression Summary Table[a]

| Predictor variable | Beta[b] | Exponent (B)[b] | Wald statistic | *p* value of Wald $\chi^2$ |
|---|---|---|---|---|
| Years of formal education | 0.181 | 1.199 | 10.249 | .001 |
| Rural upbringing[c] | –0.700 | 0.497 | 6.629 | .010 |
| Rural residence as adult[d] | 0.262 | 1.299 | 0.747 | .387 |
| Percent of life in state | –1.014 | 0.363 | 5.667 | .017 |
| Level of personal wildlife value orientation[e] | –0.641 | 0.527 | 32.049 | < .001 |

[a] Summary statistics: Model $\chi^2 = 62.25$, $df = 5$, $p < .001$. Nagelkerke pseudo $R^2 = .205$. In the full model, 67.8% of cases were correctly classified, compared to 52.8% in the null model.

[b] Beta, the logistic regression coefficient, represents the natural log of the change in odds ratio that a subject will belong to the dissimilar basic beliefs group. Exp(B), the exponentiated value of Beta, is the actual change in the odds ratio.

[c] Calculated by dividing years lived on a farm, ranch, or rural area outside of a town (through age 17) by 17.

[d] Calculated by dividing years lived on a farm, ranch, or rural area outside of a town (beginning at age 18) by age minus 17.

[e] Index equal to mean value of responses to nine wildlife value orientation items (Cronbach's $\alpha = .72$); index scores ranged from +3 (strongly utilitarian) to -3 (strongly protectionist).

plained 21% of the variance in group membership (Table 3). In the full model, 68% of the cases were classified correctly, compared to 53% in the null model. In support of our hypotheses, four of the five participant characteristics were significant predictors of group membership. As years of formal education increased, respondents were less likely to be members of the similar values group (indicated by an Exponent (B) value greater than one). In contrast, as rural upbringing, residential stability, and extremity of personal utilitarian value orientation increased, respondents were more likely to be members of the similar values group (indicated by an Exponent (B) value less than one). One variable, rural residence as adult, failed to predict group membership.

## Discussion

On average, older hunting license holders in this study perceived differences between their own basic beliefs about wildlife and the basic beliefs of other family members. These results are cross-sectional and descriptive. Furthermore, the results are based on measuring individuals' perceptions of other family members' beliefs. The other family members were not questioned. Given these limitations, our results do not confirm stability or change in basic beliefs about wildlife. Nevertheless, the results are suggestive about both cultural stability and cultural change, as well as processes that may underlie them.



Cultural stability is suggested by our finding that perceived family differences in basic beliefs tended to be small because most respondents reported few differences between their own thinking and that of other family members. This finding is consistent with past research that highlights the importance of parental influence on children's values (Grusec & Kuczynski, 1997) and the high level of values-correspondence between parents and adult children (Rohan & Zanna, 1996). If basic beliefs varied markedly between two successive generations, the value orientations of a culture would exhibit little stability over time.

Both cultural stability and cultural change are suggested by the pattern of perceived gender differences we uncovered. Male respondents perceived that their own basic beliefs about wildlife resembled those of other males more closely than those of females. Furthermore, males' basic beliefs were perceived as being more utilitarian, and females' basic beliefs were perceived as being more protectionist. This finding is consistent with other research suggesting that wildlife value orientations may differ systematically by gender (Zinn & Pierce, 2002) and that, compared to females, males exhibit less emotional attachment to wildlife and less opposition to using and dominating wildlife (Kellert & Berry, 1987; Miller & McGee, 2000).

This pattern of gender differences in perceived basic beliefs about wildlife may be related to gender differences in behaviors that parents model for children. Hunting often involves cooperative efforts between parent and child (or other partners) during the course of a mutually enjoyable activity. Research suggests that children are highly receptive to internalizing parental values during such periods of enjoyable cooperative effort or "mutual compliance" (Kochanska & Thompson, 1997, p. 65). Thus, participation in the traditional hunting initiation process may be an important antecedent to the formation of wildlife value orientations.

The initiation of adolescent males into hunting by older, male family members is a well-documented phenomenon (Brown, Decker, Siemer, & Enck, 2000; O'Leary, Behrens-Tepper, McGuire, & Dottavio, 1987). In contrast, the initiation of adolescent females into hunting by older family members of either gender has been far less common (although this pattern may be changing). Gender differences in hunting initiation and participation may be part of a complex of behaviors and beliefs that have served cultural stability by reinforcing traditional gender roles in U.S. society. Cultural stability, however, is not absolute over time. In recent decades, for example, gender roles in U.S. society have been evolving rapidly. The traditional ascription of "provider" roles to males and "nurturer" roles to females is less common than it has been. These shifting gender role ascriptions may signal future shifts in the wildlife value orientations of males and females and/or future change in the gender ratio of hunters.

The processes underlying cultural stability and cultural change are also sug-

gested by the differences we found between respondents who perceived similar basic beliefs among family members and respondents who perceived dissimilar basic beliefs among family members. Compared to those who perceived dissimilar basic beliefs, those who perceived similar basic beliefs were more likely to have grown up in a rural area, more likely to have lived their entire lives in one state, and less likely to have attended college. This pattern suggests that basic beliefs about wildlife may be most stable in families that are least touched by three major sociodemographic trends. The U.S. population is becoming increasingly urban (U.S. Department of Commerce [USDC], 2000), relocating between states more often (USDC, 1995), and attending school longer (Siegel, 1993). All three of these large-scale, long-term trends predicted the degree to which respondents perceived family differences in basic beliefs about wildlife, suggesting that the trends and changes in basic beliefs may be associated.

Other research suggests that values in the U.S. and other developed countries may be shifting away from a utilitarian orientation (see Inglehart, 1997, for extensive longitudinal data). Although Inglehart's data do not establish causal mechanisms, they do link shifting value orientations to urbanization, decreasing residential stability, and increasing levels of formal education. Our data, like Inglehart's, do not establish causal mechanisms. Furthermore, our data do not provide evidence of the direction of shifts in values orientations. Our data do, however, support the findings of Inglehart and others by suggesting that values change, rather than stability, is associated with three large-scale, sociodemographic trends, all of which are currently occurring in this country. To the extent that wildlife value orientations undergo an extended period of change, the long-term success of wildlife management agencies will depend on successful anticipation of and adaptation to that change.

### Future Research

Additional research is needed to develop a more complete understanding of patterns of wildlife value orientations within families, as well as relationships among wildlife value orientations, orientations toward other environmental issues, and social correlates for these beliefs. Furthermore, the methodological limitations of this study should be addressed by conducting additional research utilizing a variety of methods.

*Patterns of wildlife value orientations within families.* To better understand patterns of wildlife value orientations within families it will be important to investigate life cycle changes in basic beliefs about wildlife. Anecdotal evidence is conflicting. It sometimes suggests that aging is linked to growing conservatism and more utilitarian wildlife value orientations. At other times, it points to aging hunters who give up active participation, explaining that they have gotten "softhearted" or "had enough killing," suggesting that aging may be linked to protectionist wildlife value orientations. The possibility that predictable shifts toward a utilitarian or protectionist orientation may occur through the life cycle has not been tested.



A better understanding of patterns of wildlife value orientations within families will also require investigating gender differences in these beliefs. The gender differences we uncovered need to be tested in additional samples. Furthermore, the relationship between gender and nurturer versus provider roles needs to be examined closely, in terms of both perceived and actual roles and across family groups that take on traditional and nontraditional roles.

*Wildlife value orientations, other environmental issues, and social correlates.* The extent to which wildlife value orientations are related to basic beliefs about other environmental issues is unknown. It might be argued that wildlife value orientations should predict responses to forest management, river management, and other environmental issues because wildlife may be the most salient component of the natural environment for many people. To our knowledge, however, there have been no empirical tests of this argument, and competing arguments could be made. Testing relationships between wildlife value orientations and basic beliefs about other environmental issues could make a contribution to theoretical knowledge about the operation of related beliefs in the cognitive structure and make a practical contribution to our ability to understand and predict public responses to a variety of resource management issues.

In this study, we identified four variables—education, rural upbringing, residential stability, and intensity of wildlife value orientations—that were associated with older hunters' perceptions of similarities between their own and family members' wildlife value orientations. Additional research will be required to test the generalizability of these relationships across populations, as well as to identify other related variables and explicitly test causal relationships.

*Methodological issues.* This study used a quantitative approach to measuring single subjects' own basic beliefs and their perceptions of the basic beliefs of other family members in three different generations. This method allowed us to collect information about multiple individuals and multiple generations from a single subject, a procedure that was cost-effective and time-efficient and that avoided the effects of historical events that confound longitudinal studies. In other words, our approach enabled us, to some degree, to sidestep problems associated with longitudinal research. Nevertheless, our approach had important limitations. First, as pointed out earlier, measuring one individual's perceptions of another individual's beliefs is far different than measuring beliefs directly. Perceptions are important in and of themselves, but directly measuring the beliefs of different family members, as well as measuring perceptions, will provide additional understanding of the values acquisition process. Second, longitudinal research, in spite of its disadvantages, has important advantages. In particular, a well-designed longitudinal study may be the only way to advance our knowledge of changes in one

subject's value orientations over time. Finally, it will be important to study wildlife value orientations among families using a combination of quantitative and qualitative research methods (e.g., DeRuiter, 2002). A full understanding of basic beliefs about wildlife (or any other complex topic) is unlikely to emerge from one method alone.

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