

Louisiana State University

LSU Scholarly Repository

LSU Master's Theses

Graduate School

2009

Moderating effects of knowledge, gender, and education on the relationship between environmental value orientation and support for Louisiana coastal restoration

Meya Voorhies Holloway

Louisiana State University and Agricultural and Mechanical College

Follow this and additional works at: https://repository.lsu.edu/gradschool_theses



Part of the [Environmental Sciences Commons](#)

Recommended Citation

Holloway, Meya Voorhies, "Moderating effects of knowledge, gender, and education on the relationship between environmental value orientation and support for Louisiana coastal restoration" (2009). *LSU Master's Theses*. 3403.

https://repository.lsu.edu/gradschool_theses/3403

This Thesis is brought to you for free and open access by the Graduate School at LSU Scholarly Repository. It has been accepted for inclusion in LSU Master's Theses by an authorized graduate school editor of LSU Scholarly Repository. For more information, please contact gradetd@lsu.edu.

**MODERATING EFFECTS OF KNOWLEDGE, GENDER, AND EDUCATION ON THE
RELATIONSHIP BETWEEN ENVIROMENTAL VALUE ORIENTATION AND
SUPPORT FOR LOUISIANA COASTAL RESTORATION**

A Thesis

Submitted to the Graduate Faculty of the
Louisiana State University and
Agricultural and Mechanic College
in partial fulfillment of the
requirements for the degree of
Master of Science

In

The School of Renewable Natural Resources

by
Meya Voorhies-Holloway
B.S. University of Louisiana at Lafayette, 2003
May, 2009

TABLE OF CONTENTS

LIST OF TABLES.....	iii
LIST OF FIGURES.....	iv
ABSTRACT.....	v
CHAPTER 1. INTRODUCTION.....	1
Purpose.....	4
Hypothesis.....	4
CHAPTER 2. LITERATURE REVIEW.....	6
Values.....	6
Value Orientation.....	7
Knowledge.....	9
Demographics.....	9
CHAPTER 3. METHODS.....	12
CHAPTER 4. RESULTS.....	17
CHAPTER 5. CONCLUSION.....	27
REFERENCES	33
APPENDIX: QUESTIONNAIRE.....	39
VITA.....	48

LIST OF TABLES

1. Homeowner attitudes toward coastal wetland values among Mississippi Valley homeowners, 2006.....	18
2. Percent respondents by value orientation among Mississippi Valley homeowners, 2006.....	19
3. Principal component analysis of homeowner value orientation toward coastal wetlands among Mississippi Valley homeowners, 2006.....	19
4. ANOVA model of perceptions of federal funding for coastal restoration by value orientation among Mississippi Valley homeowners, 2006.....	20
5. Log linear model of support for increased funding for coastal restoration by value orientation among Mississippi Valley homeowners, 2006.....	21
6. Survey question looking at understanding of the “America’s Wetland” campaign among Mississippi Valley homeowners, 2006.....	21
7. Survey question determining knowledge of Louisiana’s coastal wetlands prior to the receipt of the survey among Mississippi Valley homeowners, 2006.....	22
8. Survey question used to create knowledge scale, by percent “Yes” among Biocentric and Anthropocentric Mississippi Valley homeowners, 2006.....	23
9. Log linear model of moderating effect of knowledge on the relationship between support for increased funding for coastal restoration and value orientation among Mississippi Valley homeowners, 2006.....	23
10. Chi-square test of value orientation by gender among Mississippi Valley homeowners, 2006.....	24
11. Chi-square test of moderating effect of gender on the relationship between support for increased funding for coastal restoration and value orientation among Mississippi Valley homeowners, 2006.....	24
12. Highest level of education completed among Mississippi Valley homeowners, 2006.....	25
13. Chi-square test of value orientation by education, among Mississippi Valley homeowners, 2006.....	25
14. Chi-square test of moderating effect of education on the relationship between support for increased funding for coastal restoration and value orientation among Mississippi Valley homeowners, 2006.....	26

LIST OF FIGURES

1. Moderating effects of knowledge and socio-demographic variables (gender and education) on the relationship between Biocentric or Anthropocentric value orientation and coastal restoration attitudes (support for Louisiana coastal restoration) modified from Dougherty et al. (2003) and Tarrant et al. (1997).....5

ABSTRACT

Coastal Louisiana marshes are eroding at a rate equivalent to one football field every thirty minutes. It is vital to understand the perceptions of the American public regarding this issue. I conducted a self-administered mail survey during the spring of 2006. The survey was sent to 4,500 residents living in the Mississippi River Valley. The survey was used to identify respondents environmental value orientations, assess respondents attitudes with regards to support for restoration funding for Louisiana's coastal wetlands, and to determine if outside moderating effects occurred to make respondents with specific value orientations (Anthropocentric or Biocentric) more likely to support restoration funding. The moderating effects examined in this study included knowledge of Louisiana's coastal wetlands, respondents gender, and respondents level of education. Respondents in this study expressed positive attitudes toward coastal wetland protection. Value orientation had a significant contribution to perceptions of federal funding for coastal restoration. Biocentric individuals are more than four times as likely to support increased funding for coastal restoration. Knowledge and understanding of the coastal wetlands appeared to be lacking among respondent. Biocentric respondents with low knowledge scores were twice as likely to support restoration as Anthropocentric respondents with low knowledge scores.

Individuals with a high score on the knowledge scale were more likely to state that current funding levels were too low regardless of value orientation. Biocentric Individuals with low knowledge scores exhibited support for funding. This positive support was amplified with increased knowledge. Anthropocentric individuals with low knowledge scores exhibited negative support for funding. The direction of support was reversed with increased knowledge.

Biocentric (66.9%) and Anthropocentric (45.8%) males were more likely to support funding than Biocentric (57.9%) and Anthropocentric females (45.8%). I also found that as level of

education increased, from less than high school to individuals with a graduate/professional degree, the likelihood to support restoration also increased for Biocentric individuals. This study suggests that managers need to understand how value orientations are contributing to stakeholder opposition or support for restoration programs. It also provides evidence for the importance of education and outreach programs.

CHAPTER 1. INTRODUCTION

Coastal Louisiana offers the nation a plethora of commodities. These assets range from providing close to one-third (approximately 40%) of the country's seafood to supplying over one-fourth of its oil and gas supply. Although these commercial goods tend to garner the most attention, the resource that facilitates these goods conversely deserves the national recognition. This precious commodity has been coined as "America's Wetland" by a national awareness and education campaign initiated in August of 2002 by then Governor Mike Foster. Despite the campaign's claim that it has increased public awareness of coastal erosion, it may be that the importance of Louisiana's wetlands still remains ambiguous to the majority of the nation. If this issue is to receive the policy priority it requires, it is vital that the American public understand that the loss of coastal wetlands is not just a local crisis. The majority of information in this study about Louisiana's coastal wetlands was obtained from the American's Wetlands website (www.americanswetlandresources.com).

The benefits of restoring Louisiana's wetlands will far exceed the cost. The functions, natural resources, and goods that Louisiana's wetlands provide contribute substantially to the national economy. The seafood industry depends on these wetlands to provide habitat and sanctuary for a large percentage of the marine life in the Gulf of Mexico. It is here in coastal Louisiana that one-third of the nation's seafood is produced. This area leads the nation in production of oysters and supplies 50% of the nation's shrimp. The wetlands also serve as a protective barrier for many oil and gas pipelines. Without the protection provided from the wetlands, these pipelines would become susceptible to storm damage and other environmental elements. The Port of South Louisiana, one of the most important ports in the nation, is located

in the wetlands of Louisiana along with seven of the top ten commercial fishing ports.

(America's Wetlands, 2006).

Commercial values only account for a portion of the wetlands merit. They also serve as a recreation headquarters for hunting, fishing, and ecotourism. In 2000, an estimated 5 million species of migratory waterfowl utilized habitat in Louisiana's wetlands (LDWF, 2000). In 2005, Louisiana's tourism industry was projected to top \$10 billion dollars (Louisiana Department of Culture Recreation, and Tourism Annual Report, 2004). There are also numerous species of wildlife that depend on the wetlands to provide food, safety, and habitat to ensure their survival. It is within this sensitive coastal ecosystem that many species of neo-tropical migrant birds come to breed. In addition, eleven threatened/endangered species have been reported to live and thrive off Louisiana's coastal wetlands (Louisiana.gov, 2006). The brown pelican, previously on the endangered species list, now inhabits the barrier islands of coastal Louisiana (Louisiana Dept. Natural Resources, 1999). Louisiana's Wetlands also provide erosion and flood control, storm buffers and serve as a natural sewer system able to remove chemicals from water (USGS, 2006). If 80 miles of coastal marsh below New Orleans had been restored prior to hurricanes Katrina and Rita, the city would have sustained substantially less flooding (America's Wetland, 2006).

In light of the recent hurricanes that ravished coastal Louisiana during late summer and fall of 2005, more attention has been given to the importance of wetland restoration. In a preliminary report, the USGS declared that Southern Louisiana lost more than 100 miles of marsh as a result of these horrific storms (USGS, 2005). Wetland deterioration, the alteration of vegetated ground to open water, is not a new problem. (America's Wetland, 2006). Since 1930, Louisiana's net loss has been a staggering 1.2 million acres. The current rate of loss totals about 22,000 acres annually which equals to about a football field every half-hour (www.louisiana.gov,

2006). Human activity alone accounts for 70% of the damage wetlands sustain. It has been estimated that by 2050 we could lose an additional 800,000 acres if the current rate of loss is not slowed and awareness and support for coastal restoration funding is not made a national priority (USGS, 2006).

Citizen support for environmental restoration is essential in order to successfully implement future mitigations. The current campaigns, such as America's Wetlands, do not seem to be attracting the media attention needed to propagate further actions to be taken. Therefore, we need to understand what pitfalls, if any, the current campaigns may be experiencing. The first step is to learn what level of awareness citizens have, what citizens are being reached and what it is about these citizens that make them more likely to support restoration. In order to measure awareness and support for coastal restoration, one needs to first understand underlying value orientation. This understanding allows conclusions to be drawn about why different people hold different positions in regards to environmental awareness and support for restoration funding (Vaske & Donnelly 1999). After segmenting citizens by their associated value orientation, researchers can then look to see if there are socio-demographic attributes that have a tendency to be associated with each. In my study, further investigation of the Anthropocentric to Biocentric value orientation continuum (Shindler et al 1993; Steel et al. 1994; Thompson & Barton 1994) is explored. My study also addressed the theory that predicts more precise value orientations influence attitudes regarding specific circumstances, and that these attitudes influence behaviors (Vaske & Donnelly 1999). Values, although part of the cognitive hierarchy, were not specifically addressed directly due to research indicating that constituents may share core values and engage in completely different behaviors (Black, Stern, & Elsworth 1985). The need to expand on the

cognitive hierarchy by looking at knowledge and socio-demographic variables as moderators in the cognitive hierarchy was also addressed.

By building on previous research, this study provides further evidence of the association between value orientation, socio-demographic variables, knowledge, attitudes and environmental behaviors. In order to achieve environmentally conscious behaviors one needs to be aware that different value orientations drive people to engage in different behaviors. Managers can use this insight as a way to effectively boost public awareness and consequently increase willingness to fund restoration efforts.

Purpose

This survey was used to assess environmental value orientation, knowledge, attitudes, and behavior regarding coastal restoration efforts in Louisiana. Past studies have mainly focused on the fundamental value/attitude relationship and the attitude/behavior relationship. In this study, I looked at the moderating effect of knowledge on the relationship between specific value orientations (Biocentric/Anthropocentric) and specific attitudes. Following the suggestions of Van Liere and Dunlap (1980), this study paid equal attention to cognitive variables and demographic attributes (Van Liere & Dunlap, 1980). A visible representation was constructed to meet my specific criteria by combining concepts implicated and modified from Dougherty et al. (2003) and Tarrant et al. (1997).

Hypothesis

The intent of this study was to assess environmental value orientation, knowledge, and attitudes toward coastal restoration efforts in Louisiana.

1. Stakeholder value orientation (Biocentric/Anthropocentric) can predict attitudes toward Louisiana coastal restoration

2. Stakeholder knowledge of coastal wetlands will serve as a moderator between Biocentric/Anthropocentric value orientation and attitudes toward Louisiana coastal restoration.
3. Stakeholder socio-demographic variables (gender and education), will serve as moderators between Biocentric/Anthropocentric value orientation and attitudes toward Louisiana coastal restoration.

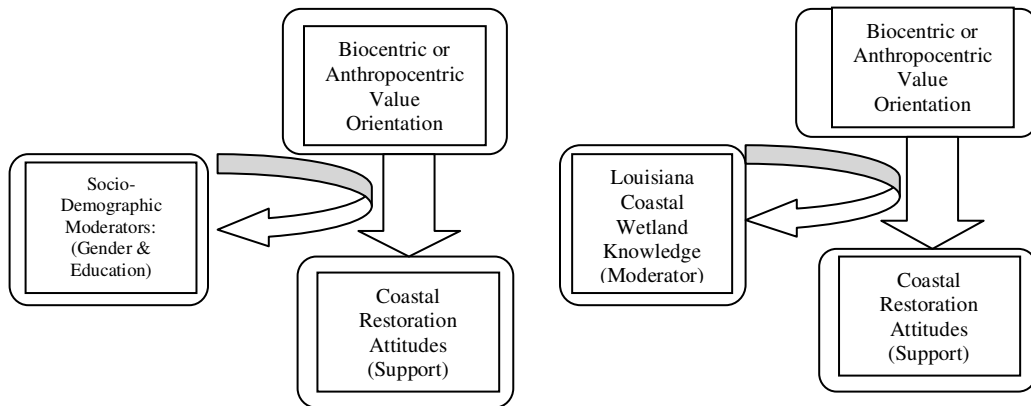


Figure 1. Moderating effects of knowledge and socio-demographic variables (gender and education) on the relationship between Biocentric or Anthropocentric value orientation and coastal restoration attitudes (support for Louisiana coastal restoration) modified from Dougherty et al. (2003) and Tarrant et al. (1997).

CHAPTER 2. LITERATURE REVIEW

Research utilizing social psychological theories has been used for decades to gain better insight into constituent's positions on environmental issues. Social psychology, in the framework of these environmental studies, refers to the how people perceive, comprehend, and construe the environmental world (Aronson et al. 1999). One theory that is classically utilized in human dimensions research is the cognitive approach. This theory focuses on the concept of human thought being assembled in to a hierarchy of cognitions (Bem 1970, Fishbein & Ajzen 1975, Homer & Kahle 1988, Feather 1990). Within the theoretical framework of the cognitive hierarchy, each behavior is considered to build on one another (Homer & Kahle 1988, Rokeach 1973, 1979). Empirical support shows that using the cognitive hierarchy can aid in understanding and predicting responses to natural resource issues (Vaske & Donnelly, 1999). The hierarchical reversed pyramid formation begins with basic values at the base, followed by value orientations/belief patterns, attitudes and norms, behavioral intentions, and peaks at behaviors (Fulton et al. 1996).

Values

In groundwork research, Rokeach (1973) defined values as “an enduring belief that a specific mode of conduct or end-state of existence is personally or socially preferable to an opposite or inverse mode of conduct or end-state of existence”. He identified 18 terminal values and 18 instrumental values (Rokeach, 1973). Proceeding research by Schwartz built on Rokeach's work by discussing 10 fundamental value domains (Swartz et. at., 1990). It is these core values that form the base of the cognitive hierarchy and are essential to the formation of beliefs. They tend to be the smallest in number and relatively stable over time (Rokeach, 1973). These values are a representation of our basic life-needs and do not focus on specific objects or situations (Fulton et al. 1996). The study of environmental values has been used to identify divergence in people's attitudes with regards to wildlife issues (Kellert, 1976; Purdy & Decker,

1989), and as an influence on behavior through higher order beliefs and attitudes (Homer and Kahle 1988, Kristiansen & Matheson 1990). Values that cluster together tend to formulate value systems. These systems are known as value orientation (Fulton et al 1996).

Value Orientation

Value orientation provides a link between widely held values and specific attitudes. These orientations serve as a strengthening mechanism that gives meaning to fundamental values (Vaske & Donnelly, 1999). Wildlife value orientations are defined “by the pattern of direction and intensity among a set of basic beliefs regarding wildlife...” (Homer & Kahle, 1988 ; Schwartz, 1992; Stern et al., 1993; Fulton et al. 1996). Many different approaches have been used to group value orientation. One approach developed by Stern and Dietz (1994) considered three different environmental value orientations. These encompassed a Biocentric orientation, where nature is cherished for its own sake, an Egoistic orientation relating to the importance of nature for oneself, and a Social-Altruistic orientation where value is placed on nature for its benefits to human-beings (Stern & Dietz, 1994). Other relevant research found patterns of basic beliefs from value orientation clustering into two separate, yet not mutually exclusive continuums, Biocentric/Anthropocentric and Benefits/Existence (Fulton et al., 1996). More commonly, past research has concentrated on a specific value orientation continuum. This recurrently studied continuum, which I chose to use in this study due to its predictive validity, is the Anthropocentric to Biocentric continuum (Shindler et al. 1993; Steel et al. 1994; Thompson and Barton 1994). It has been demonstrated that the Biocentric/Anthropocentric value orientation continuum can be used to predict a respondent’s attitude toward the preservation of wild lands and that the attitude fully mediates the relationship between value orientation and behavioral intention to vote for wild land preservation (Vaske & Donnelly, 1999).

Anthropocentric oriented constituents support the idea that human beings are and have to be the most important, highly regarded and honored beings. They will usually consider, look after, and care for human beings, above all other entities. Conversely, Biocentric oriented constituent's value nature for its own sake (Stern & Dietz, 1994). This worldview encompasses an intrinsic value of the natural world in that it is independent of direct human utilitarianism (Kennedy & Thomas, 1995). Biocentric value oriented individuals tend to be less supportive of current management practice and economic developments than their Anthropogenic counterparts (McFarland & Boxall, 2000). It has been validated that value orientation, such as these, gives rise to specific attitudes (Stern et al., 1993). Specific attitudes are strongly associated with specific behaviors (Ajzen & Fishbein, 1980; Weigel & Weigel, 1978). Value orientation and attitudes will then consequently both directly influence behavior supporting the structural integrity of the cognitive hierarchy (Manfredo & Fulton, 1997). In relation to this study, the theoretical construct of cognitive hierarchy helps create a better understanding of the foundation of a constituent's attitudes and consequently their behaviors toward the restoration of Louisiana's coastal wetlands. Whereas this information is very important, I wanted to also determine if other outside socio-demographic factors or knowledge regarding coastal wetlands may be moderating the linkage between value orientation and behavior. Past studies have mainly focused on the fundamental value/attitude relationship and the attitude/behavior relationship. In my study, I examined value orientation as a predictor to attitudes and behaviors toward the restoration of Louisiana's coastal wetlands. I also looked at the moderating effect of knowledge, gender and education on the relationship between specific value orientations (Biocentric/Anthropocentric) and specific attitudes (perceived support levels of current funding for Louisiana coastal wetland restoration).

Few studies to date have considered knowledge, gender or education as possible moderators in the framework of the cognitive hierarchy. A moderator is considered a variable that amplifies the strength or direction of connection between predictor and independent variable and can be used to identify subgroups of specific importance (Baron & Kenny, 1986; Tarrant & Cordell 2002; Dougherty, Fulton, & Anderson 2003).

Knowledge

Knowledge has been found to be an external moderator between the relationship of values and specific attitudes (Tarrant, Bright, & Cordell 1997) as well as a moderator between attitudes and behavior (Kellert & Brown, 1985; Bright & Manfredi, 1995). Past research also suggest that the level of factual knowledge about the environment will yield an attitude about the environment that is more consistent with individuals' fundamental values (Zinn & Pierce, 2002). In this study I looked at the moderating effect of knowledge on the relationship between value orientations (Biocentric/Anthropocentric) and perceived levels of support for current funding of Louisiana coastal wetland restoration.

Demographics

Demographic attributes have been studied for their predictive validity. Empirical studies have conclusively found that, regardless of global geographic location, men are more informed of scientific issues than females (Hayes 2001). The evidence also substantiates that females have less confidence in the benefits science may offer and therefore are less prone to be aware of scientific and technological advancements (Hayes 2001). There are not, however, conclusive results when considering the relationship between gender and environmental attitudes.

Davidson and Freudenburg found that women were more likely than men to convey high levels of concern when presented with a possible environmental risk (Hayes 2001). This finding

was amplified when a specific environmental risk was assessed. For example, females tended to show more concern than men when the threat was locally based or site-specific. Although many studies have found gender differences in environmental knowledge and concern (e.g. Davidson &Freudenburg 1996), there are just as many that have found no difference (e.g. Van Liere & Dunlap 1980).

Another demographic area extensively studied is education as a predictor of environmental concern. Van Lier and Dunlap's (1980) review showed consistent support for the use of education as a predictor of environmental concern. A moderately-strong positive relationship between education and environmental concern can be noted across the twenty-one studies explored in the Van Lier and Dunlap review. Inglehart (1990), a study included in the review, found there to be a correlation between increased education and an increased positive attitude for environmental protection. Controversy, Steel et al. (1994) found a discrepancy in the results of an identical national and local survey. In the national survey education appeared to be a significant predictor of environmental attitudes, whereas, in a single state survey this was not found. Unlike findings looking at other demographics, education coefficients tend to be more consistent within and across studies, which implicates education as a more consistent predictor of environmental concern. Despite this consistency, education is often grouped with other demographic variables such as income and occupation. This forms a combined social class variable that that does not have as strongly correlated results.

Tarrant and Cordell (2002) were the first to explore the moderating effect of outside demographic variables to the value/attitude relationship. They found age and ethnic background to play a crucial role in improving the prediction of environmental attitudes from underlying values. This information is especially important when considering target groups for

environmental campaigns. Dougherty et al., also considered the effect of demographic attributes as moderators. Their research concluded that gender acts as a moderator by influencing the strength of the correlation and predictability between value and attitudes.

Demographics (e.g., gender and education) have been shown to be predictive of Biocentric/Anthropocentric value orientations and consequently norms (Dougherty et al., 2003). Constituents who are women, have lower incomes, or are younger tend to be clustered along the Biocentric value orientation (McFarlane and Boxall, 2000). Women tend to display a stronger value/attitude relationship than men when looking at the acceptability of lethal deer control in Cuyahoga Valley National Park (Dougherty et al., 2003).

In this study I looked at the moderating effect of certain demographic variables on the relationship between value orientations (Biocentric/Anthropocentric) and perceived levels of support for current funding of Louisiana coastal wetland restoration.

CHAPTER 3. METHODS

Study participants consisted of a stratified random sample of 4,500 homeowners residing in the U.S. Mississippi River Valley. This population was selected based on the assumption that people in this region may experience a closer connection to the problems of coastal Louisiana and Mississippi due to proximity and use of the Mississippi River for commerce. The sample frame consisted of homeowners of single-family units from 10 states bordering the Mississippi River (Louisiana, Mississippi, Arkansas, Tennessee Kentucky, Iowa, Illinois, Missouri, Wisconsin, and Minnesota). The sample frame was stratified into 4 groups: 1) 1500 residents of the Lower Mississippi Valley (LMV), consisting of the states of Arkansas, Kentucky, Louisiana, Mississippi, and Tennessee; 2) 1500 residents from the Upper Mississippi Valley (UMV), specifically from the states of Iowa, Illinois, Minnesota, Missouri, and Wisconsin; and 3) 1500 residents from the coastal states (CS) of Louisiana (n = 1000) and Mississippi (N = 500). I chose to sample Louisiana and Mississippi (CS) differently based on the relative size of the coastal region and population differences in the coastal areas. Sample size was within the 95% confidence interval at +/- 3% sampling error. "A confidence interval for a population parameter is an interval that is calculated from a random sample of an underlying population such that, if the sampling was repeated numerous times and the confidence interval recalculated from each sample according to the same method, a proportion p of the confidence intervals would contain the population parameter in question" (Wikipedia). Participants were randomly selected from property tax databases purchased from a commercial sampling corporation (Survey Sampling, Inc., Fairfield, CN).

A mail survey was deemed appropriate for this study due to several reasons. A mail survey allowed the me to address complicated issues and gather more data than other methods

(i.e., telephone or Internet survey). Due to the large sample frame (4,500 homeowners), a mail survey was more cost effective and allowing to a larger geographical area to be reached. Respondents to mail surveys were also permitted to complete the survey on their own time unlike phone/personal interviews where the respondent is forced to complete the survey immediately if they wish to participate. An Internet survey was ruled impractical, due to questionnaire access on the Internet by individuals in the sampled population.

A self-administered mail-back survey, accompanied by a cover letter and stamped return envelope (hereafter referred to as “complete packet”) was sent to homeowners selected for this study. Questionnaires and envelopes were coded with reference numbers corresponding to names and addresses listed in the sample database. The method utilized to administer the survey followed guidelines set forth by the modified Dillman approach (Dillman 2000). Respondents were informed that participation in the survey was strictly voluntary and their responses remained completely confidential. Administration of the survey began during May 2006 and consisted of three survey waves, with each survey wave consisting of the complete packet followed 10 days later by a reminder postcard to non-respondents. A total of 3 complete packets and 2 postcard waves were mailed. Responses were coded as nominal, categorical, or interval data depending on the nature of the questionnaire item using SPSS 14.0 (SPSS, 2006). No group size effects were present in this study. This was indicated by a low eta (< 0.50) on all proceeding analysis.

Value orientation was measured through responses to 10 items located in section two of the questionnaire. Responses were given using a 7-point Likert-type scale (1 = “Strongly Disagree” through 7 = “Strongly Agree” with 4 = “Unsure”). I used a 7-point scale because it provided greater variance. The scale used to assign value orientation was modeled after the New

Environmental Paradigm (NEP). This model was adapted due to the predictive validity of the NEP in determining value orientations in numerous previous studies (Van Liere, Kent D., & Dunlap, Riley E, 1980; Schultz., & Oskamp, 1996; Stern, Dietz, & Guagnano, 1995; Tarrant & Cordell, 1997). Past research suggests using scales measuring specific environmental attitudes rather than general (Ajzen & Fishbein, 1980). Consequently, I modified the NEP scale so that it concentrated specifically on wetlands. My modified NEP scale created a Biocentric continuum and an Anthropocentric continuum ranging from the most to the least value oriented individual in each orientation. The five questionnaire items representing the Anthropocentric value orientation continuum were: “Coastal wetlands are not worth spending money to save”, “The primary value of wetlands is to provide products useful to people”, “Without people wetlands have no value”, “The primary value of wetlands is to generate money and economic self-resilience for communities”, “Too much attention is given to preserving wetlands in our society.” The five items that represented the Biocentric value orientation continuum were: “Tough wetland laws are needed even if they interfere with development”, “Dredging canals through wetlands harms them and should not be done”, “Wetland wildlife and plants have as much right to exist as people”, “Preserving coastal wetlands is more important than coastal economic development”, “Wetlands should not be altered for human benefit.” Principal Components Analysis (PCA) with varimax rotation was used to determine variable groupings defining value orientation toward wetland ecosystems. Responses associated with each variable within the resulting components were then added and the sum divided by the total items in the factor to provide an additive (combined) index of that factor. The resulting combined index variable for value orientation was then used as an indicator variable in subsequent analyses. Knowledge was measured by presenting study participants with a list of 10 different economic and ecological functions of Louisiana coastal

wetlands and asking them to indicate “Yes” or “No” to whether they knew these facts prior to receipt of the survey questionnaire. This information was retrieved from section three, question two in the questionnaire. Responses to these binomial items were totaled for each respondent, and those individuals reporting “Yes” to less than half of the items were categorized as “Low” on the knowledge scale and those responding “Yes” to more than half of the items categorized as “High” on the knowledge scale. This binomial scale using a simple “pass” “fail” approach allowed me to analyze my data using a hierarchical log linear model.

I measured specific attitudes by examining support for Louisiana coastal restoration as perception of current federal funding for Louisiana coastal restoration. Perception of current levels of federal funding for coastal wetland restoration was determined as the response to a statement that gave current annual federal government spending (\$50 million) on coastal restoration projects in Louisiana (Questionnaire Section 3, question 4). Respondents were asked their opinions on the amount spent. Five possible responses were provided (1 = “Much Too Low,” 2 = “Too Low,” 3 = “About Right,” 4 = “Too High,” 5 = “Much Too High”). Differences in perceived levels of current funding for wetland restoration between the two values orientations were determined with an Analysis of Variance (ANOVA) model. To examine perception of current funding as a binomial variable in the log-linear model, I collapsed “Much Too Low” and “Too Low” into a single category that corresponded to grouping respondents who perceived current federal funding for coastal restoration to be low and the remaining responses into a single variable that represented individuals who did not perceive current funding as low. I then examined the relationship between values orientation and attitudes toward funding for coastal wetland restoration by constructing an initial log-linear model with perceived funding as the dependent variable (Low/Not Low) and value orientation (Biocentric/Anthropocentric) as the

independent variable. The moderating effect of knowledge was tested with a hierarchical log-linear model using perceived level of funding as the dependent variable (Low/Not Low) and both value orientation (Biocentric/Anthropocentric) and knowledge (Low/High) as independent variables. Differences in demographics by values orientation were examined using Pearson's Chi-Square test. In addition, moderating effects of demographics (gender and education) were tested using a Chi-square test with perceived level of funding as the dependent variable (Low/Not Low), value orientation (Biocentric/Anthropocentric) as the independent variable and the socio-demographic (gender or education) as the covariant.

CHAPTER 4. RESULTS

I received a total of 1,441 (35.1%) completed questionnaires from across the sample strata of my study. Responses by region consisted of: Upper Mississippi Valley (UMV) 447 (31%); Lower Mississippi Valley (LMV) 432 (30%); Mississippi 144 (10%); and Louisiana 418 (29%). Most respondents supported the idea that tough wetland laws are needed even if they interfere with development(77%) and wetland wildlife and plants have as much right to exist as people (70%). A large percentage also disagreed with the following ideas: coastal wetlands were not worth spending money to save (88%), without people wetlands have no value (78%), the primary function of coastal wetlands are to generate money and economic self-resilience for communities (72%), and too much attention is given to preserving coastal wetlands in our society (75%). Responses were mixed on attitudes toward the harm of dredging canals through coastal wetlands, with 45% agreeing and 40% unsure. Respondents were also in less agreement to the following ideas: The primary value of coastal wetlands is to provide products useful to people (56% disagreed to some extent), preserving coastal wetlands is more important than coastal economic development (57% agreed), and that wetlands should not be altered for human benefit (50% agreed)(Table 1).

Principal component analysis produced two components from the 10 Likert-type scale items. Items were divided evenly between Biocentric and Anthropocentric values orientations. Seventy-five percent of respondents fell into the Biocentric category, eleven percent fell into the Anthropocentric category and fourteen percent in the neutral category. I did not include individuals in the neutral category in my analysis (Table 2). The five Biocentric items produced a Cronbach's alpha reliability coefficient of 0.767, and included statements addressing wetland protection, preservation, and existence rights of wetland plants and animals.

Table 1. Homeowner attitudes toward coastal wetland values among Mississippi Valley homeowners, 2006. (N = 1161)

	Strongly Disagree (%)	Disagree (%)	Slightly Disagree (%)	Unsure (%)	Slightly Agree (%)	Agree (%)	Strongly Agree (%)	\bar{X}
Tough wetland laws are needed even if they interfere with development.	2	4	6	11	18	37	22	5.37
Coastal wetlands are not worth spending money to save.	39	39	10	7	2	2	1	2.04
The primary value of wetlands is to provide products useful to people.	15	29	12	18	10	12	4	3.31
Dredging canals through wetlands harms them and should not be done.	2	6	7	40	9	21	15	4.69
Wetland wildlife and plants have as much right to exist as people.	5	8	10	7	16	31	23	5.06
Preserving coastal wetlands is more important than coastal economic development.	2	7	9	25	16	27	14	4.85
Without people wetlands have no value.	29	38	11	10	3	5	4	2.50
The primary value of wetlands is to generate money and economic self-resilience for communities.	23	38	11	18	5	4	1	2.64
Wetlands should not be altered for human benefit.	4	11	17	18	13	24	13	4.50
Too much attention is given to preserving wetlands in our society.	24	35	16	15	5	3	2	2.62

Table 2. Percent respondents by value orientation among Mississippi Valley homeowners, 2006. (N=972)

Value Orientation	Percentage
Biocentric (N=724)	75%
Anthropocentric (N=108)	14%
Neutral (N=140)	11%

The five Anthropocentric items produced a Cronbach's alpha reliability coefficient of 0.783, and consisted of items related to economic importance of wetlands, and wetland values depended upon human use. This is a measure of the reliability of my variables. In other words, how closely they related to the underlying concept. Given the high values (0.783 and 0.767), my concepts relate very closely to the underlying value orientation. Scores will range from 0.0 to 1.0, with values approaching 1.0 to be the most reliable values (Table 3).

Table 3. Principal component analysis of homeowner value orientation toward coastal wetlands among Mississippi Valley homeowners, 2006.

Value Orientation	Loadings	
	PC1	PC2
<i>Biocentric value orientation (Cronbach's $\alpha = 0.767$)</i>		
"Wetlands should not be altered for human benefit."	.744	
"Tough wetland laws are needed even if they interfere with development."	.703	
"Preserving coastal wetlands is more important than coastal economic development."	.697	
"Wetland wildlife and plants have as much to exist as people."	.688	
"Dredging canals through wetlands harms them and should not be done."	.614	
<i>Anthropocentric value orientation (Cronbach's $\alpha = 0.783$)</i>		
"Value of wetlands is to generate money for communities."		.808
"The primary value of wetlands is to provide products useful to people."		.727
"Without people, wetlands have no value."		.723
"Too much attention is given to preserving wetlands."		.623
"Coastal wetlands are not worth spending money to save."		.614

Significant differences in perceived funding for coastal wetland restoration was found to exist between the 2 values orientation groups ($F = 31.57, p < 0.001$) (Table 4). This supported my first hypothesis stating attitudes toward Louisiana coastal wetland restoration was dependent on the environmental value orientation of the individual. More individuals with a Biocentric value orientation (63%) reported funding for restoration was “Too Low” or “Much Too Low” compared with those individuals with an Anthropocentric value orientation (42%). A plurality (41%) of individuals with an Anthropocentric value orientation responded that they perceived current funding levels to be “About Right,” whereas the highest percentage of Biocentric respondents (42%) perceived current funding to be “Too Low” (Table 4).

Table 4. ANOVA model of perceptions of federal funding for coastal restoration by value orientation among Mississippi Valley homeowners, 2006. (N = 1021)

“The federal government spends 50 million dollars annually on coastal restoration projects. Do you think this amount is...?”	Value orientation	
	% Biocentric (N = 680)	% Anthropocentric (N = 102)
Much too low	22	16
Too low	42	27
About right	30	41
Too high	5	11
Much too high	3	6

($F = 31.57, p < 0.001, \eta = 0.183$)

The log-linear model for perceived level of federal funding for Louisiana coastal wetland restoration by value orientation among respondents revealed that the perceptions of funding as “too low” among individuals with a Biocentric values orientation was approximately 4.5 times higher than that of those with an Anthropocentric value orientation. This indicates Biocentric individuals were more than four times as likely to support increased funding for coastal restoration than Anthropocentric respondents (Table 5).

Table 5. Log linear model of support for increased funding for coastal restoration by value orientation among Mississippi Valley homeowners, 2006.

Value Orientation	Odds Ratio
Biocentric	4.46
Anthropocentric	

Respondents lacked a clear understanding of what The America’s Wetlands Campaign aimed to accomplish. Only 7% of responds correctly identified the programs initiatives. Fifty-five percent reported to have never heard of the campaign (Table 6).

Table 6. Survey question looking at understanding of the “America’s Wetland” campaign among Mississippi Valley homeowners, 2006.

Please state your understanding of the “America’s Wetland” campaign by checking the appropriate response below:	
I have not heard of the “America’s Wetland” campaign	55%
It aims to protect wetlands throughout the U.S.	21%
It is focused on protecting coastal wetlands throughout the U.S.	14%
It is focused on protecting wetlands in the Gulf of Mexico	3%
It is focused on protecting wetlands in coastal Louisiana	7%

General knowledge of Louisiana coastal wetlands was measured by asking respondents to answer “Yes, I knew this” or “No, I did not know this” before receiving the questionnaire to ten statements. The information contained in the ten items was retrieved from the American’s Wetland’s Campaign website (www.americaswetlands.com). Overall respondents displayed low knowledge of the functions and importance of Louisiana’s coastal wetlands (Table 7). The only fact that generated a higher percentage of prior knowledge was “Louisiana’s coastal wetlands are where 25% of the nation’s oil and gas supply is transported” (62%). For the context of my study, I looked at knowledge by Biocentric and Anthropocentric value orientation (Table 8).

I found differences in knowledge of coastal wetland ecological and economic functions were significant between Biocentric and Anthropocentric respondents for 2 of the 9 items provided: extent of wetland loss ($\chi^2 = 6.935, p < 0.05$) and number of threatened and endangered species dependent on Louisiana coastal wetlands for habitat ($\chi^2 = 6.398, p < 0.05$) (Table 8). No significant differences at $\alpha = 0.05$ were found for the remaining 7 scale items. More than half of respondents, Anthropocentric (64%) and Biocentric (63%), reported that they were aware that 25% of the United States supply of gas and oil was transported through Louisiana coastal wetlands, whereas approximately half of respondents (Biocentric 49% and Anthropocentric 53%) responded that they knew coastal Louisiana's wetlands produced 50% of the nation's shrimp. Responses to the remaining scale items indicated less than 50% of participants, regardless of value orientation, had prior knowledge of the economic and ecological functions of coastal wetlands in Louisiana. Most respondents were classified as low on the knowledge scale: 78% among Biocentric values orientation and 81% for Anthropocentric values orientation ($\chi^2 = 1.01, p = 0.316$)(Table 8).

Table 7. Survey question determining knowledge of Louisiana's coastal wetlands prior to the receipt of the survey among Mississippi Valley homeowners, 2006. (N=1133)

Before receiving this questionnaire, did you know that Louisiana's coastal wetlands are...	No, I did not know this	Yes, I did know this
Supplying over 50% of shrimp for the United States	51%	49%
The location of 40% of the United States coastal wetlands	71%	29%
Where 25% of the nations oil and gas supply is transported	38%	62%
Losing more than 1,900 square miles of land since the 1930s	67%	33%
Losing a football field of land every 38 minutes	78%	22%
The location of 30% of the fisheries catches for the U.S.	72%	28%
The largest wintering habitat for migratory birds	55%	45%
Habitat of more than 70 threatened and endangered species	81%	19%
The leading producer of oysters for the United States	63%	37%
Supporting the largest Menhaden catch in the U.S	94%	6%

Table 8. Survey question used to create knowledge scale, by percent “Yes” among Biocentric and Anthropocentric Mississippi Valley homeowners, 2006. (N=1133)

“Before receiving this questionnaire, did you know that Louisiana’s coastal wetlands are...”	Biocentric % Yes	Anthropocentric % Yes	χ^2
Where 25% of US gas and oil are transported?	62	64	0.289
Supplying over 50% of shrimp for US?	49	53	0.884
The largest wintering habitat for migratory birds?	47	42	4.687
Leading producer of oysters in US?	38	35	0.584
The location of 40% of US coastal wetlands?	30	29	0.122
Losing more than 1900 mi. ² of land since the 1930’s?	36	27	6.935 ^a
The location of more than 30% of fisheries in US?	29	30	0.088
Losing more than a football field of land every 30 minutes?	24	20	1.150
Habitat of more than 70 threatened and endangered species?	21	14	6.398 ^a

Log-odds for perceptions that funding for coastal wetland restoration was too low increased from 1.45 among individuals with Biocentric value orientation and low knowledge scores to 3.25 among those with higher knowledge scores. Similar increases were observed among respondents with an Anthropocentric value orientation. Log-odds that perceived funding was “too low” increased from -1.59 among those with low knowledge scores to 1.26 among Anthropocentric respondents with high knowledge scores (Table 9).

Table 9. Log linear model of moderating effect of knowledge on the relationship between support for increased funding for coastal restoration and value orientation among Mississippi Valley homeowners, 2006

Knowledge	Value Orientation	Log-odds for Support
Low	Biocentric	1.45
	Anthropocentric	-1.59
High	Biocentric	3.25
	Anthropocentric	1.26

Overall, I received more surveys returned from males than females. Sixty-five percent of respondents were males compared to the 35% who were female. In order to determine if socio-demographic variables played roles in subsequent analysis, I broke gender down by value orientation, Biocentric and Anthropocentric. I found that a slightly larger number of females

(80%) were Biocentric compared to males (72%). The opposite was found looking at Anthropocentric where 28% of males were Anthropocentric compared to 20% of females. A significant difference was noted between Anthropocentric and Biocentric value orientations for both male and females ($\chi^2 = 7.211, p < 0.01$), (Table 10).

Table 10. Chi-square test of value orientation by gender among Mississippi Valley homeowners, 2006.

Gender	Biocentric	Anthropocentric
Male	71.6	28.4
Female	79.6	20.4

A Significant difference was detected when looking at Biocentric ($p=0.021$) and Anthropocentric ($p=0.015$) respondents support for funding by gender. Biocentric males (67%) were more likely to support funding than Biocentric females (58%). This pattern held true for Anthropocentric respondents as well. Anthropocentric males (46%) were more likely to support funding than Anthropocentric females (28%) (Table 11).

Table 11. Chi-square test of moderating effect of gender on the relationship between support for increased funding for coastal restoration and value orientation among Mississippi Valley homeowners, 2006.

Value Orientation	Gender	Support Yes	Support No	χ^2
		(%)	(%)	
Biocentric	Male	67	33	5.35**
	Female	58	42	
Anthropocentric	Male	46	54	5.96**
	Female	28	72	

** $p < 0.001$

The majority of survey participants had at least graduated high school (96%). Only 4% or respondents had less than a high school education. A large percent had some college (19%), a bachelor's degree (18%) or a graduate or professional degree (19%) (Table 12). For the purposes of my study, I looked at education by value orientation. The highest percentage of Biocentric respondents (85%) reported to have less than a high school education while, the highest percentage of Anthropocentric respondents reported to have a graduate degree (36%)(Table 13).

Tech school attendees were 80% Biocentric and 20% Anthropocentric. Among those who attended some college, 79% were Biocentric and 22% were Anthropocentric. A higher percentage of respondents who obtained an associates degree (80%), bachelor's degree (69%), or a graduate/professional degree (64%) fell into the Biocentric category. This also held true for those who attended some graduate school where 69% were Biocentric. A significant difference was found between value orientation and level of education ($\chi^2=20.15, p<0.001$)(Table 13).

Table 12. Highest level of education completed among Mississippi Valley homeowners, 2006. (N=1113)

Level of Education	Overall Percentage
Less than high school	4%
Graduated high school	19%
Technical/Vocational school	9%
Some college	19%
Associate degree (2 years of college)	9%
Bachelor's degree	18%
Some graduate study	5%
Graduate or professional degree	17%

Table 13. Chi-square test of value orientation by education among Mississippi Valley Homeowners, 2006 (N=1113)

Education Level	Biocentric%	Anthropocentric%
<High School	85	15
Graduated High School	78	22
Tech School	80	20
Some College	79	22
Associates degree	80	20
Bachelors degree	69	31
Some grad school	69	31
Grad or Prof School	64	36

($\chi^2=20.15, p<0.001, =0.132$)

A significant difference was detected when looking at the relationship between biocentric individuals and their willingness to support restoration by education

($\chi^2=24.78, p=0.001$), (Table 14). As level of education increased, from less than high school to

holders of a graduate/professional degree, likelihood to support restoration also increased.

We did not find any moderating effects when looking at Anthropocentric individuals

($\chi^2=13.45$, $p= 0.062$), (Table 14).

Table 14. Chi-square test of moderating effect of education on the relationship between support for increased funding for coastal restoration and value orientation among Mississippi Valley homeowners, 2006.

Education	Biocentric Support Yes	Biocentric Support No	Anthro. Support Yes	Anthro. Support No
<high school	48%	52%	20%	80%
Graduated high school	57%	44%	22%	78%
Tech- school	53%	47%	39%	61%
Some College	58%	42%	51%	49%
Assoc. degree	61%	39%	33%	67%
Bachelors degree	75%	25%	41%	59%
Some grad. study	73%	27%	70%	31%
Grad/Professional. degree	77%	23%	46%	55%

CHAPTER 5. CONCLUSION

Citizen support plays a major role in the successful implementation of environmental restoration. In order for management practices to gain the acceptance of stakeholders, they must first understand what characteristics make them more or less likely to support the environmental issues at hand. In this study I examined the relationship between attitudes and environmental value orientation (Biocentric and Anthropocentric). Specifically, I wanted to determine if support for coastal wetland restoration is dependent on the environmental value orientation of the individual. Once this relationship was determined, I wanted to see if other variables (knowledge, gender, and education) might serve as moderators to strengthen, amplify or change the connection between support for restoration and environmental value orientation

Overall, participants gave positive responses for statements related to coastal wetland protection. Seventy-eight percent stated that they disagreed or strongly disagreed with the statement “coastal wetlands are not worth spending money to save”. However, there did appear to be some disagreement when looking at why wetlands should be protected. Fifty-seven percent of respondents agreed with the statement “preserving coastal wetlands is more important than economic development”. On the contrary, 50% agreed wetlands should be altered for human benefit. This shows that different arenas of thinking are at play, further supporting the need to understand underlying stakeholder value orientation. If managers consider only positive response to funding for coastal restoration and do not consider the underlying value orientation, they could lose the support of many stakeholders.

My findings suggest that although support for coastal wetland restoration was high, knowledge and understanding of the issue appeared to be lacking among respondents.

Louisiana’s Coastal wetlands encompass 40% of the U.S coastal wetlands, are important

components of food production and protect valuable commodities for the entire nation. Only 7% of respondents correctly defined the target area of The America's Wetland Campaign. Despite the campaigns outreach, findings presented here suggest these benefits are generally unknown among the general public.

Results indicated that respondents with a Biocentric value orientation possessed greater knowledge of the functions and benefits Louisiana coastal wetlands provide than their Anthropocentric counterparts. This difference suggests that Biocentric respondents are more receptive to conservation efforts. On the whole, most respondents were classified as low on the knowledge scale. This implies that current outreach programs are not effective in educating the general public. That a significant difference in knowledge was found to exist for items related to extent of wetland loss and number of threatened and endangered species suggests information is available and perhaps sought or accepted differentially between members of the two value orientations. Over half of Biocentric (62%) and Anthropocentric (64%) respondents stated prior knowledge that Louisiana's coastal wetlands were where 25% of US gas and oil was transported, which was the highest percentages among all knowledge items. This suggests other factors such as issue salience might be contributing to higher knowledge. Salience theory suggests that issues tend to draw more attention when they affect people's lives on a personal level (Young, 2007; Rabinowitz, Prothro & Jacoby, 1982).

Results from this study indicated that the majority of survey respondents expressed a Biocentric value orientation. This held true regardless of gender. Contrary to past studies looking at gender and value orientation, this study did not find a significant difference between the two. Biocentric respondents were more than five times as likely (85%) to have less than a

high school education than anthropocentric respondents (15%). The highest percentage of anthropocentric respondents held a graduate or professional degree (56%).

My first hypothesis, stakeholder value orientation (Biocentric/Anthropocentric) can predict attitudes toward coastal restoration, was supported by a significant difference between Anthropocentric and Biocentric respondents support for coastal restoration. Value orientation had a significant contribution in perceptions of federal funding for coastal restoration. The log-linear model for perceived level of federal funding for Louisiana coastal wetland restoration by value orientation showed perceptions of restoration funding as “too low” was more than four times as high among individuals with a Biocentric value orientation than those with an Anthropocentric value orientation. This indicates Biocentric individuals are four times more likely to support increased funding for coastal restoration. More than twice the proportion of respondents (17%) with an Anthropocentric value orientation perceived current funding for coastal restoration was “too high” or “much to high” compared to those individuals with a Biocentric value orientation (7%). These findings are in line with past research indicating value orientation as a direct predictor of willingness to support environmental issues (Manfredo et al., 1997). Studies show that individuals with a Biocentric value orientation tend to be less supportive of current management practices and economic development than their Anthropocentric counterparts (McFarland & Boxall, 2000). A corresponding difference also was observed between the two orientations groups for perceptions that funding was “too low” or “much to low” (42% for Anthropocentric vs. 63% for Biocentric value orientation). Without a base of public support for needed funding, ecosystem restoration dependent on federal action cannot be accomplished. Therefore, it is important to determine possible difference among public stakeholders regarding federal funding for ecosystem restoration.

My second hypothesis, examining the moderating effect of knowledge on the relationship between value orientation and support of coastal restoration, was supported by a difference detected when comparing knowledge score to support for funding for coastal restoration by value orientation. Biocentric respondents with low knowledge scores were twice as likely to support coastal restoration as Anthropocentric respondents with low knowledge scores. This indicates individuals with a Biocentric value orientation showed a stronger likelihood to support restoration in the absence of specific knowledge of the benefits provided by coastal wetlands. This finding might suggest support for coastal wetland restoration is based more on value orientation than specifics of the issue. The hierarchical log-linear model that incorporated the knowledge scale suggested that, in light of knowledge of coastal wetland functions, individuals with a high score on the knowledge scale were more likely to state that current funding levels were too low regardless of value orientation. Knowledge as a moderator had an amplification effect on Biocentric respondents support for coastal restoration but reversed the direction of support for coastal restoration for Anthropocentric respondents. This result suggests the importance of education and outreach programs in gaining support for environmental issues. Further research on the moderating effects of knowledge could give insight on the impact higher knowledge has on citizens' willingness to support environmental restoration initiatives. Future studies are needed to gain a better understanding of the moderating effects of knowledge.

My third hypothesis looked at demographics (gender and education) as moderators on the relationship between support for coastal restoration and value orientation. A significant difference was detected when looking at Biocentric and Anthropocentric respondents support for funding by gender. This finding pointed to the moderating effect of gender on the relationship between value orientation and support for restoration, supporting my hypothesis. A higher

percentage of both Biocentric males (67%) and females (58%) responded yes to supporting coastal restoration. My results support past literature stating Biocentric individuals are more likely to support environmental issues. These findings were further supported by a higher percentage of both Anthropocentric male (54%) and female (72%) respondents indicating a lack of support for coastal restoration. Biocentric males (67%) were more likely to support funding than Biocentric females (58%). The same pattern was found for Anthropocentric respondents who supported funding. Anthropocentric males (46%) were more likely to support funding than Anthropocentric females (28%). One possible explanation for the fact that males, Biocentric and Anthropocentric, showed stronger moderating effects than females could have been the survey subject. Past research by Mohai has shown women are more likely than men to concentrate on local rather than national environmental issues (Mohai, 1992).

Education was also found to be a moderator in the support - value orientation relationship. A significant difference was detected when looking at the relationship between Biocentric individuals and their willingness to support restoration. As level of education increased, from less than high school to individuals with a graduate/professional degree, the likelihood of supporting restoration also increased. This suggests that increased education does moderate the relationship between Biocentric value orientation and support for funding, supporting my hypothesis. I did not find any moderating effects when looking at Anthropocentric individuals. There was no discernable amplification pattern when looking at Anthropocentric individuals who did not support funding by level of education. Little research has been conducted looking at moderating effects of education. I suggest further research in this area needs to be conducted to make conclusive statements about why education had moderating effects on Biocentric, but not Anthropocentric respondents. Perhaps monetary issues come into

play differently between the two value orientations as education increases. One possible hypothesis could explore the relationship between increased level of education and positive (i.e., accepting) acceptance of information regarding environmental issues.

Based on the findings presented here, I suggest value orientation as one approach to assessing differences in support for ecosystem restoration and knowledge, gender, education as possible moderators to amplify or change the relationship between value orientation and attitudes. By understanding the role of value orientation stakeholders can be targeted more effectively. This insight can help managers have a better understanding of why certain groups are interpreting and conveying information differently. Subsequently, understanding the likelihood that certain individuals will support funding could help reshape restoration initiatives and result in increased levels of citizen support. In addition, increased educational programming may also provide an expanded base of public support and perhaps improve funding support for restoring damaged and threatened ecosystems.

REFERENCES

- America's Wetlands. (2006). "America's Wetland Official Numbers".
http://www.americaswetlandresources.com/background_facts/thenumbers/index.html
- Ajzen, I., & Fishbien, M. (1980). Understanding Attitudes and Predicting Social Behavior. Englewood Cliffs, NJ: Prentice Hall.
- Ball-Rokeach, S. J., Rokeach, M., & Grube, J.W..(1984). The Great American Values Test: Influencing behavior and belief through television. *New York: Free Press.*
- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51, 1173-1182.
- Bem, D. J. (1970). *Beliefs, attitudes, and human affairs*. Belmont, CA: Brooks/Cole.
- Bjerke T., & Kaltenborn BP. (1999) The relationship of ecocentric and anthropocentric motives to attitudes toward large carnivores. *Journal of Environmental Psychology*, 19 (4), 415-421.
- Burger, J. (1998). Environmental attitudes and perceptions of future land use at the Savannah River Site: Are there racial differences? *Journal of Toxicology & Environmental Health: Part A*, 53(4), 255-262.
- Bright, A., & Manfredi, M. (1995). The quality of attitudinal information regarding natural resource issues: The role of attitude-strength, importance and information. *Society and Natural Resources*, 8, 399-414.
- Buttel, F.H., & Flinn, W.L.. (1976). Environmental Politics: the structuring of partisan and ideological cleavages in mass environmental attitudes. *Sociological Quarterly*, 17,477-90.
- Clark, C. F., Kotchen, M. J., & Moore, M.(2002). International and External Influences on Pro-Environmental Behavior: Participation in a Green Electricity Program. *Journal of Environmental Psychology*, 22, 237-246.
- Connelly, N. A., & Knuth, B. A. (2002). Using the Co-orientation Model to Compare Community Leaders' and Local Residents' Views About Hudson River Ecosystem Restoration. *Society & Natural Resources*, 15(10), 933-948.
- Cromartie, J.B., & Wardwell, J.M.. (1999). Migrants settling far and wide in the rural west. *Rural Development Perspectives* 14(2), 2-8.

- Davidson, D.J., & Freudenburg, W.R.. (1996). Gender and Environmental Risk Concerns: A Review and Analysis of Available Literature. *Environment and Behavior* 28, 302-39.
- Dougherty, E. M., Fulton, D. C., & Anderson, D. H. (2003) The Influence of Gender on the Relationship between Wildlife Value Orientations, Beliefs, and the Acceptability of Lethal Deer Control in Cuyahoga Valley National Park. *Society & Natural Resources*, 16(7), 603.
- Feather, N.T. (1990). Bridging the gap between values and actions: Recent applications of the expectancy-value model. In E.T. Higgins & R. M. Sorrentino (Eds.), (1990), *Handbook of motivation and cognition: foundations of social behavior*, Vol. 2. New York, NY, USA: The Guilford Press.
- Fishbein, M., & Ajzen, I. (1975). *Belief attitude, intention and behavior*. Reading, MA: Addison-Wesley
- Fulton, D. C., Manfredo M. J., & Lipscomb, J..(1996). Wildlife Value Orientations: A Conceptual and Measure-mental Approach. *Human Dimensions of Wildlife*, 1, 24-47.
- Guagnano, G. A., Stern, P. C., & Dietz, T.(1995). Influences on attitude-behavior relationships: A natural experiment with curbside recycling. *Environment and Behavior*, 27(5), 699-718.
- Hayes, B.C. (2001). Gender and Scientific Knowledge, and Attitudes toward the Environment: A Cross-National Analysis. *Political Research Quarterly* 54(3), 657-671.
- Homer, P.M., & Kahle, L. R.. (1988). A Structural Equation test of the value-attitude-behavior hierarchy. *Journal of Personality and Social Psychology*, 54, 638-646.
- Manfredo, M. J., & Dayer, A. A. (2004) Concepts for Exploring the Social Aspects of Human-Wildlife Conflict in a Global Context. *Human Dimensions of Wildlife*, 9(4), 17-328
- Inglehart, R. (1990). *Culture shift in advanced industrial society*. Princeton University Press. Princeton, NJ. 484pg.
- Kellert, S. R. (1976). Perceptions of animals in American society. *Transactions of the 41st North American Wildlife Conference*, 41, 533-546.
- Kellert, S. R., & Berry, J. K. (1980). *Knowledge, affection and basic attitudes toward animals in American society*. #024-010-00-625-1, U. S. Government Printing Service, Washington, DC, 162pg.
- Kellert, S.R., & Brown, P.J.. (1985). Human dimensions information in wildlife management, policy and planning: introductory comments to the special issue on human dimensions in wildlife management. *Journal of Leisure Sciences* 7(3), 269 280.

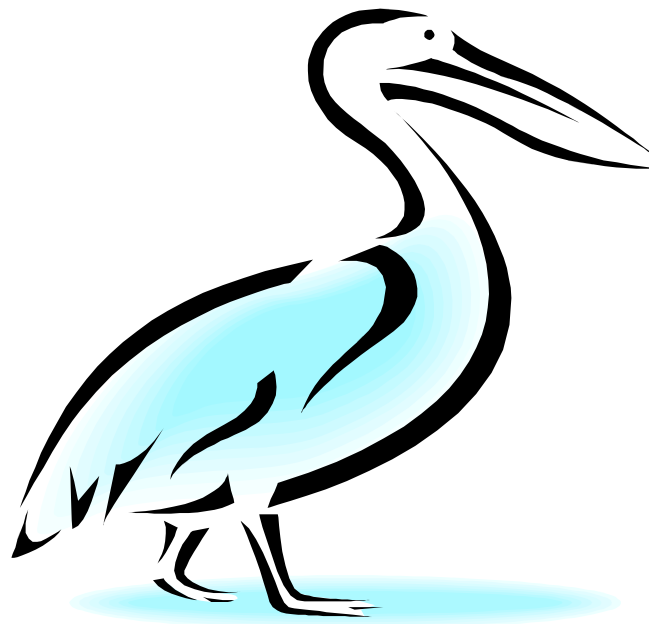
- Kennedy, J. J., & Thomas, J. W. (1995). Managing natural resources as social value. In R. L. Knight & S. F. Bates, eds. *A new century for natural resource management*, p. 311-321. Washington, DC, Island Press.
- Kristiansen, C.M., & Matheson, K. (1990). Value justification, integrative complexity, and attitudes toward nuclear weapons. *Journal of Social Psychology*, 130, 665-675.
- Louisiana.gov. (2006) "Louisiana Coastal Facts". Retrieved January, 2006, from <http://dnr.louisiana.gov/crm/coastalfacts.asp>
- Louisiana Department of Culture Recreation, and Tourism.(2004). Annual Report. Retrieved January, 2006, From <http://www.crt.state.la.us/arts/2004annualreport.pdf>.
- Louisiana Department of Natural Resources. (1999). Coast 2050: toward a sustainable coastal Louisiana : report of the Louisiana Coastal Wetlands Conservation and Restoration Task Force and the Wetlands Conservation and Restoration Authority. Retrieved January, 2006, from http://coast2050.gov/reports/app_b_1.pdf.
- Louisiana Department of Wildlife and Fisheries. (2000). Unpublished Report. Waterfowl Population Estimates in Louisiana's Coastal Zone Below U.S. Highway 90 and on Catahoula Lake. Baton Rouge, LA.
- Manfredo, M.J., & Dayer, A.A. (2004) Concepts for Exploring the Social Aspects of Human-Wildlife Conflict in a Global Context. *Human Dimensions of Wildlife*, 9, 17-28
- Manfredo, M.J. & Fulton, D.C.. (1997). A comparison of wildlife values in Belize and Colorado. *Human Dimensions of Wildlife*, 2, 62-63.
- Manfredo, M.J., Fulton, D.C. & Pierce,C.L. (1970). Understanding voter behavior of wildlife ballot initiatives: Colorado's trapping amendment. *Human Dimensions of Wildlife*, 2, 22-39.
- McFarlane, B. L. (2000) Factors Influencing Forest Values And Attitudes of Two Stakeholder Groups: The Case of the...Society & Natural Resources, 13(7).
- McFarlane, B. L., & Boxall P.C. (2003) The Role of Social Psychological and Social Structural Variables in Environmental Activism: An Example of the Forest Sector. *Journal of Environmental Psychology* 23(1): 79-87.
- Meinhold, J. L., & Malkus, A. J. (2005) Adolescent Environmental Behaviors: Can Knowledge, Attitudes, and Self-Efficacy Make a Difference? *Environment & Behavior*, 37(4), 511-532.
- Mohai, P. (1992) Men, women, and the environment: An examination of the gender gap in

- environmental concern and activism. *Society and Natural Resources*, 5, 1-19.
- Purdy, K. G., & Decker, D. J. (1989a). Applying wildlife values information in management: the wildlife attitudes and values scale. *Wildlife Society Bulletin*, 17, 494-500.
- Purdy, K. G., & Decker, D. J. (1989b). Obtaining wildlife values information for management: the wildlife attitudes and values scale (wavs). Human Dimensions Research Unit Publication 89-2, Human Dimensions Research Unit, Department of Natural Resources, N. Y. S. College of Agriculture and Life Sciences, Cornell University, Ithaca, New York, 22pp.
- Rabinowitz, G., Prothro, J.W., & Jacoby, W. (1982) Salience as a Factor in the Impact of Issues on Candidate Evaluation. *The Journal of Politics*, 44(1), 52-53.
- Rokeach, M. (1973). *The nature of human values*. New York: The Free Press.
- Rokeach, M. (1979). "Introduction." In *Understanding Human Values: Individual and Societal*. Ed. Milton Rokeach. New York, NY: The Free Press. Pp. 1-11.
- Schwartz S.H., & Blisky, W. (1990). Toward a theory of the universal construct and structure of values: Extensions and cross-cultural replications. *Journal of Personality and Social Psychology*, 58(5), 878-891.
- Schwartz, S. H. (1992). Universals in the content and structure of values: theoretical advances and empirical tests in 20 countries. In M. P. Zanna (Ed.), *Advances in experimental social psychology*. CA: Academic Press.
- Shindler, B., List P., & Steel, B. S..(1993) Managing Federal Forest: Public Attitudes in Oregon and Nationwide. *Journal of Forestry*, July: 36-42.
- Somma, M., & Tolleson-Rinehart, S. (1997). Tracking the Elusive Green Women: Sex, Environmentalism and Feminism in the United States and Europe. *Political Research Quarterly*, 50,153-69.
- Steel, BS., List P., & Shindler, B. (1994) Conflicting values about Federal forests: A comparison of national and Oregon publics. *Society and Natural Resources*, 7(2), 137-153.
- Stern, Paul C., & Dietz, T. (1993). The Value Basis of Environmental Concern. *Journal of Social Issues*, 50(3), 65-84.
- Stern, P. C., & Dietz, T. (1994). The value basis of environmental concern. *Journal of Social Issues*, 50, 65-84.
- Stern, P. C., & Oskamp, S. (1987). Managing scarce environmental resources. In D. Stokols, and I. Altman (Eds.), *Handbook of environmental psychology*, 1044-1088pp.

- Tarrant, M. A., Bright, A. D., & Cordell H. K.; (1997) Attitudes Toward Wildlife Species Protection: Assessing Moderating and Mediating Effects in the Value-Attitude Relationship. *Human Dimensions of Wildlife*, 2(2), 1-20.
- Tarrant, M.A., & Cordell, H.K. (2002). Amenity values of public and private forests: Examining the value-attitude relationship. *Environmental Management*, 30(5), 692-703.
- Thomas, S. C. G., & Barton, M. A.(1994). Ecocentric and Anthropocentric Attitudes Toward the Environment. *Journal of Environmental Psychology*, 14, 149-158.
- Tremblay, K.R., Jr., & Dunlap, R.E.. (1978). Rural-urban residence and concern with environmental quality: a replication and extension. *Rural Sociology*, 43, 474-91.
- USGS. National Wetlands Research Center. (2006). LaCoast. Retrieved January, 2006, from <http://www.lacoast.gov/>. Credit: U. S. Geological Survey
- U.S. Geological Survey, U.S. Department of the Interior. (2005). USGS Reports Preliminary Wetland Loss Estimates for Southeastern Louisiana from Hurricanes Katrina and Rita. From www.usgs.org
- Van Liere, K. D., & Dunlap, R. E. (1980).The Social Bases of Environmental Concern: A Review of Hypotheses, Explanations, and Empirical Evidence. Public Opinion Quarterly.
- Vaske, J. J., & Donnelly, M. P.(1999). A Value-Attitude-Behavior Model Predicting Wild land Preservation Voting Intentions. *Society & Natural Resources*, 12(6), 523, 15p, 2 charts, 2 diagram.
- Wetter, D. W., Fiore, M. C., Young, T. B., McClure, J. B., de Moor, C. A., & Baker, T. B. (1999).Gender differences in response to nicotine replacement therapy: Objective and subjective indexes of Tobacco withdrawal. *Experimental and Clinical Psychopharmacology*, 7, 135-144.
- Williams, K.(1968) "The Concept of Values" in David L. Sills (ed.), The International Encyclopedia of the Social Sciences, 16, New York: The Free Press, 283-287.
- Young, J. E .(2007). Salience or voting as if the environment matters: the path to a green energy future and a stable climate are clearer than ever--but we do need to start voting to put ourselves on it. World Watch. Retrieved From http://goliath.ecnext.com/coms2/summary_0199-7366017_ITM
- Zinn, J. (2006). Coastal Louisiana Ecosystem Restoration After Hurricanes Katrina and Rita. CRS Report for Congress.
- Zinn, H. C., Manfredo, M. J., & Barro, S. C. (2002).Patterns of Wildlife Value Orientations in Hunters' Families. *Human Dimensions of Wildlife*, 7(3), 147-162.

Zinn, H. C., & Pierce, C. L. (2002, March). Values, Gender, and Concern About Potentially Dangerous Wildlife. *Environment & Behavior*, 34(2), 239.

Coastal Wetland Survey



**School of Renewable Natural
Resources
Louisiana State University
Renewable Natural Resource Building
Baton Rouge, La 70803**



ALL RESPONSES ARE CONFIDENTIAL
Thank You For Your Participation
Postage-paid return envelope provided

Section 1. Environmental issues facing our country Listed below are several environmental issues facing citizens in the United States. How important is each issue to you? (Please circle one number for EACH issue).

Environmental Issues	Not At All Important	Slightly Important	Moderately Important	Very Important	Extremely Important
Consumption of fossil fuels	2%	6%	21%	39%	32%
Protecting water quality	0%	1%	5%	28%	66%
Global warming	8%	10%	19%	25%	38%
Dependence on foreign oil	2%	4%	15%	28%	51%
Protecting air quality	1%	1%	10%	32%	56%
Protecting endangered species	3%	10%	25%	32%	30%
Reducing coastal wetland loss	2%	7%	20%	33%	38%
Protecting wetlands	2%	6%	21%	34%	37%
Restoring damaged ecosystems	2%	7%	24%	35%	32%
Reducing the “dead zone” in the Gulf of Mexico	5%	13%	28%	31%	23%
Protecting our coasts from hurricanes	4%	11%	21%	23%	41%

2. In the past 12 months, have you read, seen or heard anything about coastal wetland loss in the U.S.? (newspapers, magazines, tv/radio, internet, etc.)?

63% Yes 37% No

3. Please state your understanding of the “**America’s Wetland**” campaign by checking the appropriate response below:

- 55% I have not heard of the “America’s Wetland” campaign
- 21% It aims to protect wetlands throughout the U.S.
- 14% It is focused on protecting coastal wetlands throughout the U.S.
- 3% It is focused on protecting wetlands in the Gulf of Mexico
- 7% It is focused on protecting wetlands in coastal Louisiana

4. How do the following issues concerning coastal wetlands affect you personally? Please circle the number that matches the importance you place on each issue.

Wetland Issues	Not At All Important	Slightly Important	Moderately Important	Very Important	Extremely Important
Gas and oil prices	2%	5%	14%	29%	50%
Provides recreation	11%	20%	30%	24%	15%
Habitat for wildlife and fisheries	2%	6%	19%	36%	37%
Provides hurricane protection	7%	10%	19%	26%	38%
Shipping exports (grain, etc.)	6%	13%	31%	29%	21%

Shipping imports (coffee, fruit, etc.)	6%	14%	33%	28%	19%
----------------------------------------	----	-----	-----	-----	-----

Section 2. Environmental Attitudes. Please circle the number that best matches your attitude toward each statement.

Environmental Attitudes	Strongly Disagree	Disagree	Slightly Disagree	Unsure	Slightly Agree	Agree	Strongly Agree
We are approaching the limit of the number of people the earth can support.	8%	15%	7%	26%	13%	19%	12%
Humans have the right to modify the natural environment to suit their need.	18%	26%	17%	10%	16%	8%	5%
When humans interfere with nature, it often produces disastrous consequences.	3%	5%	8%	8%	17%	31%	28%
Human ingenuity will insure that we do NOT make the earth unlivable.	10%	19%	10%	25%	15%	15%	6%
Humans are severely abusing the environment.	4%	5%	6%	5%	17%	32%	31%
The earth has plenty natural resources if we just learn how to develop them.	4%	8%	6%	13%	17%	34%	18%
Plants and animals have as much right as humans to exist.	5%	8%	8%	5%	15%	34%	25%
The balance of nature is strong enough to cope with the impacts of modern industrial nations.	18%	28%	15%	17%	10%	9%	3%
Despite our special abilities, humans are still subject to the laws of nature.	1%	1%	1%	6%	11%	49%	31%
The so-called "ecological crisis" facing humankind has been greatly exaggerated.	17%	21%	10%	21%	14%	11%	6%
The earth is like a spaceship with very limited room and resources.	5%	15%	12%	12%	19%	25%	12%
Humans were meant to rule over the rest of nature.	13%	20%	12%	12%	14%	18%	11%
The balance of nature is very delicate and easily upset.	2%	6%	8%	9%	21%	35%	19%
Humans will eventually learn enough about how nature works to be able to control it.							

	15%	29%	12%	22%	11%	9%	2%
If things continue on their present course, we will soon experience a major ecological catastrophe.	4%	10%	8%	22%	14%	26%	16%

Section 3. Coastal Wetlands. Please answer the following questions about the coastal Gulf of Mexico

1. How well would you be able to explain the following concepts about wetland ecosystems to a friend? A wetland ecosystem is a system made up of all the animals and plants in a wetland. Please circle the number that matches your response.

Wetland Concepts	Could Not Explain	Explain Well
How coastal ecosystems are restored to a healthy state	40%	24%
The importance of coastal ecosystems to your everyday life	27%	21%
Why coastal ecosystem restoration is done	27%	20%
How coastal ecosystems affect the economy where you live	32%	22%
Causes of the “dead zone” in the Gulf of Mexico	54%	18%
Different causes of coastal erosion	26%	20%

2. Please tell us if you knew about each statement below **before receiving this questionnaire** by circling the number that matches your response.

Did you know that Louisiana’s coastal wetlands are...	No, I did not know this	Yes, I knew this
...the leading producer of oysters in the United States	63%	37%
...supplying over 50% of shrimp for the United States	51%	49%
...the location of 40% of the United States coastal wetlands	71%	29%
...where 25% of the nations oil and gas supply is transported	38%	62%
...losing more than 1,900 square miles of land since the 1930s	67%	33%
...losing a football field of land every 38 minutes	78%	22%
...the location of 30% of the fisheries catches for the U.S.	72%	28%
...the largest wintering habitat for migratory birds	55%	45%
...habitat of more than 70 threatened and endangered species	81%	19%
...supporting the largest Menhaden catch in the U.S	94%	6%

2. How familiar are you with efforts to restore and manage coastal wetlands in Louisiana and Mississippi? Please circle the number below that best matches your response.

Not Familiar	Slightly Familiar	Fairly Familiar	Very Familiar
46%	35%	15%	4%

3. The federal government spends \$50 million annually on coastal restoration projects. Do you think this amount is _____? (Please circle the number that matches your answer)

Much too low	Too low	About right	Too high	Much too high
19%	37%	34%	6%	4%

Louisiana receives around 27% of royalties from oil and gas production in the states offshorewaters while other states receive 50% of royalties from drilling.

4. What percent of oil and gas revenues do you think Louisiana deserves to receive?

- 3% Less than is currently received (27%)
- 11% Same as is currently received (27%)
- 66% Same as other states (50%)
- 20% More than other states (50%)

Section 5. Attitudes Toward Coastal Wetland Restoration. Please indicate whether you agree or disagree with the following statements.

People have different reasons for thinking coastal wetlands are important to our society. Indicate below how strongly you AGREE OR DISAGREE with each of the following statements. While some of the following statements may sound similar, please read each and respond by circling the number that best matches your response.

Attitudes	Strongly Disagree	Slightly Disagree	Unsure	Slightly Agree	Strongly Agree
Tough wetland laws are needed even if they interfere with development.	2%	4%	11%	18%	22%
Coastal wetlands are not worth spending money to save.	39%	10%	7%	2%	1%
Wetlands have value whether people are present or not.	2%	1%	7%	10%	32%
The primary value of wetlands is to provide products useful to people.	15%	12%	18%	10%	4%
Dredging canals through wetlands harms them and should not be done.	2%	6%	7%	40%	15%
Wetland wildlife and plants have as much right to exist as people.	5%	10%	7%	16%	23%
Tough coastal wetland laws interfere with human development.	9%	12%	25%	15%	4%

Preserving coastal wetlands is more important than coastal economic development.

2% 7% 9% 25% 16% 27% 14%

The value of wetlands exists only in the minds of people: without people wetlands have no value.

29% 38% 11% 10% 3% 5% 4%

The primary value of wetlands is to generate money and economic self-resilience for communities.

23% 38% 11% 18% 5% 4% 1%

Wetlands should not be altered for human benefit.

4% 11% 17% 18% 13% 24% 13%

Too much attention is given to preserving wetlands in our society.

24% 35% 16% 15% 5% 3% 2%

Section 6. General Information. The following information is helpful to describe different groups of households. Your answers will be used for statistical purposes and will not be identified with you personally. All responses are kept confidential.

1. Please give your gender: (Circle one number) 65% Male 35% Female

2. Please give your age (Fill in blank) _____ Years old

3. What is your ethnic/cultural group? (Please check one)

88% Caucasian/White 1% Hispanic

8% African-American 1% Native American (American Indian)

1% Asian-American 1% Other (Please specify) _____

4. What is the highest level of education you have completed? (Check one number)

4% Less than high school 9% Associate degree (2 years of college)

19% Graduated high school 18% Bachelor's degree

9% Technical/Vocational school 5% Some graduate study

19% Some college 17% Graduate or professional degree

5. In what state do you now live?

5% Iowa 9% Tennessee 12% Illinois 4% Arkansas
9% Wisconsin 7% Missouri 7% Minnesota 10% Mississippi
3% Montana 29% Louisiana 5% Kentucky

6. Have you ever lived in Louisiana?

66% Yes (If yes, go to 6a) 34% No

6a. How long did you live in Louisiana?

3% 0-6 months 2% 2 years
2% 1 year 3% 3 year 90% more than 3 years

7. How would you describe the size of the community where you live? (Check one number)

13% Rural, farm 35% Small city (10,000 to 100,000)
8% Rural non-farm 21% Mid-sized city (100,000 to 1 million)
15% Small town (under 10,000) 8% Large city (over 1 million)

8. How would you describe the size of the community where you grew up?

22% Rural, farm 25% Small city (10,000 to 100,000)
5% Rural non-farm 17% Mid-sized city (100,000 to 1 million)
22% Small town (under 10,000) 9% Large city (over 1 million)

9. Do you belong to any conservation groups? 84% Yes 16% No

10. Have you or a member of your immediate family made a trip to Louisiana during the past 12 months?

57% Yes 15% No 28% Live in Louisiana

Please use the following space for any additional comments you would like to make

Please mail the completed survey in the self-addressed envelope

THANK YOU FOR YOUR COOPERATION

VITA

Meya Voorhies-Holloway was born in July 1981 in St. Francisville, Louisiana. She attended West Feliciana High school where she graduated fifth in her class. She received a scholarship to the University of Louisiana at Lafayette as well as an excellence grant. In the fall of 1999 she began her psychology degree program. In the spring of 2002 she graduated with honors and received a bachelor of science in psychology. After graduation she moved to Tampa, Florida, where she participated in an internship with the Tampa juvenile arbitration program. In 2004 she married Mark Holloway and moved to Baton Rouge, Louisiana, where she began her master degree program at Louisiana State University in wildlife with a concentration in human dimensions. She currently resides in Baton Rouge with her husband and two sons.