

THESIS

INTEGRATING INFORMATION ON WILDLIFE VALUES AND BARRIERS TO
PARTICIPATION IN NATURE-BASED PROGRAMS TO IMPROVE AGENCY
EFFORTS FOR CONNECTING FAMILIES TO NATURE

Submitted by

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WE HEREBY RECOMMEND THAT THE THESIS PREPARED UNDER OUR SUPERVISION BY CAITLIN MCCOY ENTITLED INTEGRATING INFORMATION ON WILDLIFE VALUES AND BARRIERS TO PARTICIPATION IN NATURE-BASED PROGRAMS TO IMPROVE AGENCY EFFORTS FOR CONNECTING FAMILIES TO NATURE BE ACCEPTED AS FULFILLING IN PART REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE.

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ABSTRACT OF THESIS

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This thesis presents two manuscripts that explored how information on barriers to participation in nature-based programs and wildlife value orientations could be used to enhance the reach and effectiveness of agencies in connecting children to nature. The overall study focused on connecting children to nature in recognition of the multiple health benefits acquired by spending time in nature, as well as the relationship between time spent in nature as a child and future commitment to natural resource stewardship. The study also addressed the stake agencies have in helping connect children to nature, including maintaining and/or increasing support for future conservation initiatives and securing future funding sources.

The primary purpose of the first paper was to explore how information on wildlife value orientations and barriers to participation in nature-based programs might be integrated to improve agencies' educational initiatives. Data were collected via a mail survey administered to residents in Raleigh, North Carolina. Results indicated that there was not much of a relationship between barriers and wildlife-related interests of the respondents, suggesting that these considerations may need to be evaluated separately in

thinking about ways to develop more targeted nature-based opportunities in the future. However, given that our sample was relatively homogeneous with respect to its lack of major barriers to participation in program offerings, results also point to the need for additional research to determine if findings can be applied to other populations and geographic locations.

The second paper used past research and theory to develop a qualitative methodology to measure wildlife value orientations in a focus group setting. The focus of this paper was on developing a technique to assess wildlife value orientations among diverse populations of various cultures and ethnicities. In this technique, which was administered to Latino and Chinese-American audiences in New York City, New York, focus group participants were shown a number of photographs depicting human-wildlife interactions and were then encouraged to discuss their thoughts and reactions to each photograph. Results revealed that the focus group methodology was effective in eliciting wildlife value orientations. Four wildlife value orientation types recognized from previous literature were identified across the groups based on participants' comments. Finally, suggestions were made on how to improve the methodology for future use and how to adapt it for applications in other settings.

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I. INTRODUCTION

“Nature-deficit disorder” is a trend termed by Richard Louv (2005) that refers to the tendency among today’s youth to spend less time outdoors. Children today participate in fewer outdoor activities than children of past generations, and nature-based activity participation continues to decline (Clements, 2004; Louv, 2005; Rivkin, 1995). This is partly due to decreasing opportunities for children to connect with nature (Kimbell, Schuhmann, & Brown, 2009; Krueger & Chawla, 2002). Today, 80 percent of Americans live in urban areas (United Nations, 2008). Urban growth has changed the physical landscape surrounding homes from open spaces and wetlands to shopping malls and parking lots. Many types of unstructured play like tree climbing are criminalized in neighborhoods and parks by community ordinances. In addition, parents are wary of “stranger danger” and often do not have enough time to supervise their children outside, opting for safe play indoors (Bruyere, Teel, & Newman, 2009; Louv, 2005; Veitch, Bagley, Ball, & Salmon, 2006).

This phenomenon can be linked to a variety of broad-scale changes occurring in today’s society, including, for example, population growth and expansion as well as loss and fragmentation of land areas. Along with these changes has come a shift in how people interact with and think about the natural environment. Learning about nature increasingly occurs in indirect ways as opposed to through direct day-to-day experiences (Karsten, 2005; Louv, 2005). A child’s perceptions of the natural world are likely to be influenced more by his/her social surroundings and by television programming than by time spent outside. Given the well-established relationship between time spent outdoors as a child and future commitment to natural resource stewardship, this decrease in direct

interaction raises concerns about future generations' desire to protect natural resources (Chawla, 1988, 2003, 2007; Kimbell et al., 2009). Additional concerns tied to children spending less time outdoors include the reduction in physical activity (Hinkley, Crawford, Salmon, Okely, & Hesketh, 2008), which is associated with a variety of health problems, such as obesity, inability to cope with stress (Wells & Evans, 2003), increased risk of diseases like osteoporosis, mental conditions like depression and attention disorders (Taylor & Kuo, 2008), and decreased cognitive development and creativity (Kellert, 2005; Wells, 2000). When considering the potential consequences, both in terms of implications for human well-being and impacts on ecosystems, it is clear that the future of conservation hinges on the ability of natural resource agencies to respond to these societal trends. Formulation of a broad-based response will depend in part on the reach and effectiveness of agencies' conservation education programs, especially their strategies for connecting children to nature.

Recent research on human values toward wildlife in the western United States provides a framework for thinking about ways to improve agencies' educational initiatives in the face of changing societal conditions (Manfredo & Teel, 2008; Manfredo, Teel, & Henry, 2009; Teel, Dayer, Manfredo, & Bright, 2005; Teel & Manfredo, 2009). An important conclusion drawn from this work is the need for tailored approaches that readily attend to the diversity of values in contemporary society. Forces of modernization have affected the circumstances of daily life in America in such a way as to stimulate a shift in values toward wildlife. Similar to the more general human-nature divide that Louv (2005) describes, findings suggest that as children become removed from direct

interaction with wildlife through such changes as urbanization, this can in turn impact how they think about wildlife as adults.

In addition to considering the changing nature of today's wildlife-related interests, improved agency response must also take into account the changing *demographic* composition of American society, and, in particular, the increase in racial and ethnic diversity (Cordell, Bergstrom, Betz, & Green, 2004). This situation demands that educational initiatives are able to effectively reach children from diverse backgrounds, fostering interaction with nature in ways that are relevant to their culture (Bruyere et al., 2009). Traditional management of public lands was designed to serve the dominant culture, a culture that will soon become the minority. Novel approaches are needed in management, focusing, for example, on overcoming certain cultural barriers that may limit participation in nature-based activities and on creating more practical nature-based opportunities among urban residents who may not have the means to go on a weekend outing to a public land area.

To contribute to agency efforts to develop more innovative and targeted programs for connecting children to nature, this thesis examines the relationship between public values toward wildlife and barriers to participation in nature-based programs. The emphasis is on exploring how information about both topics might be integrated to enhance understanding of how to reach diverse audiences. The work reported here stems from a multi-state demonstration project initiated in 2009 that was designed to improve the conservation education initiatives of state fish and wildlife agencies in the United States, with a particular focus on agency strategies for connecting children/families to nature.

Thesis Organization and Purpose

Building on prior research described above, and in an effort to expand its utility, the study upon which this thesis is based was designed to help improve the reach and effectiveness of state fish and wildlife agency strategies aimed at connecting children to nature. The thesis has two objectives, each of which is addressed separately in the form of an individual article. First, Article 1 examines the relationship between wildlife value orientations and barriers to participation in nature-based programs. This paper, using data from a mail survey administered to residents in Wake County, North Carolina, explores how information on both topics might be integrated for purposes of creating more targeted nature-based education programs in the future. The second objective, addressed in Article 2, was to develop a qualitative methodology for assessing wildlife value orientations in a focus group setting. The intent in developing this type of approach, which was tested with diverse audiences in New York City, was to enhance our ability from a research standpoint to obtain wildlife values information from diverse audiences. This is an important first step in ensuring the interests of these audiences are adequately represented in future agency decisions and program offerings.

LITERATURE CITED

- Bruyere, B., Teel, T., & Newman, P. (2009). Response to "More kids in the woods: Reconnecting Americans with nature." *Journal of Forestry*, 107(7), 378-379.
- Chawla, L. (1988). Children's concern for the natural environment. *Children's Environmental Quarterly*, 5(3), 13-20.
- Chawla, L. (2003). Bonding with the natural world: The roots of environmental awareness. *NAMTA Journal*, 28(1), 133-154.

- Chawla, L. (2007). Participation and the ecology of environmental awareness and action. In A. Reid, B. B. Jensen, J. Nikel and V. Simovska (Eds.), *Participation and the Ecology of Environmental Awareness and Action*. Springer Netherlands.
- Clements, R. (2004). An investigation of the status of outdoor play. *Contemporary Issues of Early Childhood*, 5(1), 46-50.
- Cordell, H., Bergstrom, J. C., Betz, C. J., Green, G. T. (2004). Dominant socioeconomic forces shaping the future of the United States. In M. J. Manfredi, J. J. Vaske, B. L. Bruyere, D. R. Field, & P. J. Brown (Eds.), *Society and Natural Resources: A Summary of Knowledge*. Jefferson, MO: Modern Litho.
- Hinkley, T., Crawford, D., Salmon, J., Okely, A. D., & Hesketh, K. (2008). Preschool children and physical activity - A review of correlates. *American Journal of Preventive Medicine*, 34(5), 435-441.
- Karsten, L. (2005). It all used to be better? Different generations on continuity and change in urban children's daily use of space. *Children's Geographies*, 3(3), 275-290.
- Kellert, S. R. (2005). *Building for life: Designing and understanding the human – nature connection*. Washington, DC: Island Pres.
- Kimbell, A. R., Schuhmann, A., & Brown, H. (2009). More kids in the woods: Reconnecting Americans with nature. *Journal of Forestry*, 107(7), 373-377.
- Krueger, J. S., & Chawla, L. (2002). "We know something someone doesn't know...": Children speak out on local conditions in Johannesburg, *Children, Youth and Environments*, 15(2), 89-105.

- Louv, R. (2005). *Last child in the woods: Saving our children from nature-deficit disorder*. Chapel Hill, NC: Algonquin Books.
- Manfredo, M. J., & Teel, T. L. (2008). Integrating concepts: Demonstration of a multi-level model for exploring the rise of mutualism value orientations in post-industrial society (Chapter 8). In M. J. Manfredo, *Who cares about wildlife: Social science concepts for understanding human-wildlife relationships and other conservation issues*. New York: Springer Press.
- Manfredo, M. J., Teel, T. L., & Henry, K. L. (2009). Linking society and environment: A multilevel model of shifting wildlife value orientations in the western United States. *Social Science Quarterly, 90*, 407-427.
- Rivkin, M. S. (1995). *The great outdoors: Restoring children's right to play outside*. Washington, DC: National Association for the Education of Young Children.
- Teel, T. L., Dayer, A. A., Manfredo, M. J., & Bright, A. D. (2005). Regional results from the research project entitled "Wildlife Values in the West" (Project Rep. No. 58). Project Report for the Western Association of Fish and Wildlife Agencies. Fort Collins, CO: Colorado State University, Human Dimensions in Natural Resources Unit.
- Teel, T. L., & Manfredo, M. J. (2009). Understanding the diversity of public interests in wildlife conservation. *Conservation Biology, 24*(1), 128-139.
- Taylor, A., & Kuo, F. E. (2008). Children with attention deficits concentrate better after walk in the park. *Journal of Attention Disorders* Online First.
DOI:10.1177/1087054708323000.

- United Nations (2008). United Nations Population Division: World Urbanization Prospects. Retrieved from http://www.un.org/esa/population/publications/wup2007/2007WUP_Highlights_web.pdf
- Veitch, J., Bagley, S., Ball, K., & Salmon, J. (2006). Where do children usually play? A qualitative study of parents' perceptions of influences on children's active free play. *Health & Place, 12*(4), 383-393.
- Wells, N. M., & Evans, G. W. (2003). Nearby nature: A buffer of life stress among rural children. *Environment and Behavior, 35*(3), 311-330.
- Wells, N. M. (2000). At home with nature: Effects of 'greenness' on children's cognitive functioning." *Environment and Behavior, 32*(6), 775-795.

**II. THE RELATIONSHIP BETWEEN WILDLIFE VALUE ORIENTATIONS
AND BARRIERS TO PARTICIPATION IN NATURE-BASED PROGRAMS**

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INTRODUCTION

Programs designed to increase children's exposure to the outdoors can be beneficial for children of all ages, ethnicities, and socioeconomic backgrounds. These nature-based programs offer opportunities for children to connect with and experience all the wonders of the natural environment. Time spent outside also has many implications for healthy development, including a diverse array of physical, mental, and spiritual benefits (Louv, 2005). Children experience physical benefits from the exercise that is involved with natural outdoor play and exploration (Hinkley, Crawford, Salmon, Okely, & Hesketh, 2008). Mental benefits include stress reduction (Wells & Evans, 2003), an increase in cognitive skills (Kellert, 2005; Wells, 2000), and stimulation of creativity and imagination, leading to better problem-solving abilities. In addition, research has shown that children who spend more time outdoors are less likely to develop disorders like attention deficit disorder (Taylor & Kuo, 2008). Spiritually, children are able to connect with nature in their own, personal way through time spent outdoors. They learn about the world and the relationships among trees, bugs, and birds. They see their place in the world and are able to understand themselves through nature.

Nature-based programs can also have more broad-reaching benefits for society (Wells & Lekies, 2006). The creative problem-solving skills that children learn while playing outside are the kinds of skills necessary to develop sustainable solutions for our environmental problems today. The strong connections that children make with nature through these experiences influence the extent to which they care about the environment as adults (Chawla 1998, 2003, 2007; Wells & Lekies, 2006). Time spent outside at a young age can promote a sense of stewardship and desire to protect the environment

which is critical for the future protection of our natural resources (Kimbell, Schuhmann, & Brown, 2009). Children who spend time outdoors are more likely as adults to express concern for the environment, display responsible environmental behaviors, and support conservation efforts of local agencies, businesses, and non-governmental organizations.

In recognition of the numerous benefits arising from outdoor pursuits, concerns have been raised about the tendency among today's youth to spend less time outside (Clements, 2004; Rivkin, 1995), a trend that Louv (2005) calls "nature-deficit disorder." In response, natural resource agencies and other organizations across the country are devoting greater attention to nature-based programs. As children spend less time outside, natural resource agencies may lose support for future environmental and conservation initiatives and lose funding as park visitation and recreation participation (e.g. fishing, hunting) decreases (Pergams & Zeradic, 2006). Agencies must proactively confront and address this trend to maintain and even increase agency funding and support by providing opportunities for children to connect to nature.

Research suggests that, regardless of ethnicity or income level, children and parents in the United States have an interest in these kinds of programs (Bruyere, Billingsley, & O' Day, 2008). However, many families encounter barriers that prevent or limit their participation in nature-based programs. Previous research about program attendance has mostly focused on identification of specific barriers and the relationship between these barriers and sociodemographic characteristics (Allison & Hibbler, 2004; Borden, Perkins, Carleton-Hug, Stone, & Keith, 2006; Hong & Anderson, 2006; Miller, 2003). Comparisons of this nature can be valuable in that they allow agencies to better anticipate and overcome barriers to participation that may be differentially encountered

by their constituents. However, this type of segmentation is broad and may fail to capture the diversity of interests and constraints to participation that can exist *within* groups. Previous research has shown that sociodemographics tend to be weak correlates of human values and behavior in a wildlife/natural resource-related context (Teel & Manfredo, 2009). The wildlife value orientation concept has proven to be a useful segmentation tool for overcoming this limitation and providing a more in-depth understanding of diverse public interests in relation to wildlife (Bright, Manfredo, & Fulton, 2000; Manfredo, Teel, & Henry, 2009; Teel & Manfredo, 2009). In an attempt to expand the utility of this concept for wildlife agency education efforts, the current study took a unique look at the relationship between wildlife value orientations and barriers to participation in nature-based programs.

Wildlife Value Orientations

A theory known as the cognitive hierarchy, or value-attitude-behavior framework, is an approach to distinguish among the different types of cognitions that form the basis for human behavior (Homer & Kahle, 1988; Manfredo et al., 2009). At the foundation of the hierarchy are values, followed by more specific beliefs, attitudes, and behavioral intentions. Values are stable, enduring beliefs that represent preferences for appropriate “modes of conduct” or desired “end states of existence” (Rokeach, 1973, Schwartz, 1992). Values transcend specific situations and are shared within a culture. As a result, they often are unable to account for the individual variability in specific attitudes or behaviors (Bright et al., 2000). The concept of value orientations has been introduced in an attempt to address this gap. Value orientations consist of networks of basic beliefs that organize around values and provide contextual meaning to those values in relation to a

particular domain such as wildlife (Manfredo et al., 2009; Teel & Manfredo, 2009). Wildlife value orientations have been shown through prior work to predict attitudes toward an array of wildlife-related issues as well as wildlife-associated recreation behaviors (e.g., Fulton, Manfredo, & Lipscomb, 1996; Teel & Manfredo, 2009).

More recently, research has indicated that, at a societal level, changing conditions associated with modernization (i.e., urbanization, rising income and education levels) have prompted a shift away from a *domination* value orientation toward wildlife and the simultaneous rise of a *mutualism* view in the United States (Manfredo & Teel, 2008; Manfredo et al., 2009; Teel, Dayer, Manfredo, & Bright, 2005). While a domination orientation defines wildlife primarily as a resource to be used and managed for human benefit, a mutualism orientation perceives wildlife as capable of relationships of trust with humans and as life forms deserving of rights and caring. These different orientations have different implications for response to wildlife issues and for participation in wildlife-related recreation. Hunting, for example, is rooted in a domination orientation toward wildlife, whereas those with a mutualism orientation are more likely to engage in wildlife viewing. The extent to which wildlife agencies can attend to these different interests in their education programs will impact their ability to reach diverse audiences and garner broad-based support for conservation initiatives in the future. Identification of wildlife value orientations can help agencies develop a more targeted approach, designing programs that appeal to a community's core values.

Barriers to Participation in Nature-Based Programs

Research shows that most children encounter barriers that can limit their participation in outdoor activities as well as more structured education programs, and that

these barriers often vary based on sociodemographic factors. A significant amount of the literature has focused on barriers to participation among diverse audiences, while literature for Caucasians has mostly focused on motivations for participation. Seven primary barriers have been identified in the literature: cost, transportation, safety, language, awareness of opportunities, and discrimination (Allison & Hibbler, 2004; Borden et al., 2006; Bruyere et al., 2008; Burns, Autry, & Graefe, 2007; Cooper, Jackson, Azmitia, Lopez, & Dunbar, 1995; Hong & Anderson, 2006; Miller, 2003; Ponzio & Marzolla, 2002; Rideout, 2000). While some of these barriers may seem outside the scope of what agencies can fully address (e.g., time constraints), others, including for example language constraints and a lack of awareness of program offerings, are more within the realm of agency control. An understanding of these barriers and the extent to which they play a role in limiting youth/family involvement in agency education efforts is needed to explore ways to increase participation, particularly among underrepresented audiences, in future educational initiatives.

Study Purpose

Building on prior research described above, our study was intended to explore the relationship between wildlife value orientations and barriers to participation in nature-based programs using data from a survey of residents in Wake County, North Carolina. We considered how information on both topics might be integrated to create more targeted agency programs for connecting children and families to nature. Our specific focus was on determining the barriers that exist among different types of people that could be classified based on their wildlife-related interests.

METHODS

Sampling and Data Collection

Data were collected via a mail survey administered to a subset of residents in Wake County, North Carolina. The study population consisted of parents with children between the ages of 5 and 14 and who resided in highly urbanized areas (identified by zip codes) located within a 5-mile radius of the North Carolina Wildlife Resources Commission (NCWRC) Centennial Campus Center for Wildlife Education in Raleigh. This specific population was identified by our agency partner, the NCWRC, based on an interest in targeting this audience for future programs that could be offered by the Center. Samples were purchased from a commercial sampling firm, using a stratification scheme to ensure that only residents with children ages 5-14 and within the zip code regions of interest were included.

Data collection was preceded by a pre-test of the survey instrument with a small sample ($n = 43$) of the target population in order to evaluate the adequacy of survey items for measuring key concepts of interest and the effectiveness of survey design and administration procedures. A modified Dillman (2000) approach, consisting of multiple mailings, was used to maximize response to the mail survey, which was administered in the fall of 2009. The first mailing consisted of a survey and postage-paid envelope, along with a cover letter requesting participation of a parent in the household who was 18 years of age or older. A reminder postcard was then mailed out two weeks after the first mailing to those who had not yet responded. Approximately four weeks after the first mailing, a second complete mailing of the survey along with a modified cover letter was sent to those who had not yet responded. A sample of non-respondents was contacted via

phone in January 2010 to answer a small subset of questions from the mail survey, allowing for basic comparisons between respondents and non-respondents on key variables of interest in the study. The phone survey included items to assess wildlife value orientations, barriers to participation in nature-based programs, and sociodemographics.

Measurement of Key Concepts

Wildlife Value Orientations. Domination and mutualism orientations were measured using a set of 14 statements intended to elicit basic beliefs about wildlife and wildlife management (Table 2.1). Specific “belief dimensions” identified by prior research and represented in these statements reflected core areas of thought for each wildlife value orientation (Teel & Manfredi, 2009). A domination orientation was designated by two belief dimensions, appropriate use of wildlife and hunting. A mutualism orientation was also indicated by two belief dimensions, caring and social affiliation. Respondents rated their level of agreement with the wildlife belief statements on a scale from 1 = “strongly disagree” to 7 = “strongly agree”.

Barriers to Participation in Nature-Based Programs. Barriers were measured with a set of items asking about specific barriers people encounter in relation to nature-based program participation, including time, cost, transportation, awareness of opportunities, concerns about leaving children with staff and having children attend programs with staff they do not know, and trustworthiness of the agency (Table 2.2). These items were adapted from questions used in prior research on barriers to participation in informal science education programs (Bruyere et al., 2008). Respondents rated their level of agreement with the barriers statements on a scale from 1 = “strongly

disagree” to 7 = “strongly agree”. To further explore potential barriers that may not be captured by these statements, we asked respondents in an open-ended format to identify primary benefits and concerns associated with having children participate in programs about nature. Specifically, respondents were asked: “What is the best benefit you can think of for your children to participate in programs about nature?” and “What is the greatest concern you have about your children participating in programs about nature?” We collapsed responses into thematic categories prior to analysis.

Data Analysis

Data were entered and analyzed in SPSS. We examined the internal consistency and structure of wildlife value orientation and belief dimension scales by conducting reliability analysis. This analysis allowed us to assess the extent to which we obtained consistent results across multiple items measuring a given belief dimension or value orientation. We computed value orientation scores in a two-stage process. First, we gave respondents a score for each belief dimension (e.g., caring), computed as the mean of all items within that dimension, and then we assigned the value orientation (e.g., mutualism) score by computing the mean of corresponding belief dimension scores.

We segmented respondents into “value orientation types” by comparing their scores on domination and mutualism simultaneously via a cross-tabulation procedure (Teel & Manfredi, 2009). This revealed four categories of people who could be classified based on whether they scored high or low on each orientation (Table 2.3). High was defined by a score of > 4.50 (scale midpoint for each mean composite), whereas low was defined by a score of ≤ 4.50 .

We examined relationships among barriers items using correlational analysis (Pearson's r). K-means cluster analysis was performed to sort respondents into homogenous groups based on their responses to these items. The relationship between wildlife value orientations and barriers was examined by: (1) correlating (Pearson's r) barriers items with value orientation scales; (2) comparing value orientation types on barriers items using analyses of variance (ANOVA) with Dunnett's T3 post-hoc test (used because of a violation of the equal variances assumption); and (3) comparing barriers clusters on value orientation measures using ANOVA with Dunnett's T3 post-hoc test and chi-square tests. We used an alpha level of $p < 0.05$ to designate statistical significance in our analyses and computed effect size measures to help with evaluation of the practical significance of study findings (Cohen, 1988).

RESULTS

Response Rates and Non-Response Comparisons

We mailed 2201 total surveys, with 282 surveys returned as completed and 79 as undeliverable (13% response rate). We conducted a follow-up phone survey with 53 individuals, revealing some differences between respondents and non-respondents (Table 2.4). Respondents and non-respondents differed on two of three barriers questions, with respondents reportedly having less time to participate in nature-based programs and perceiving cost as more of a barrier. Respondents were also less likely than non-respondents to agree with the statement, "I value the sense of companionship that I receive from animals" (one of the items used to measure wildlife value orientations). In addition, respondents and non-respondents varied by gender, with a higher percentage of males found in the respondent sample. With the exception of the companionship item,

effect size measures for these comparisons suggested only marginal variation between respondents and non-respondents (Cohen, 1988). Given these findings, as well as the exploratory nature of our investigation, we chose not to weight our data on the basis of respondent-nonrespondent comparisons and instead recognize that residents in the target population may value the sense of companionship they receive from animals (suggestive of a mutualism orientation toward wildlife) more than our study findings indicate. It is also worth noting in this context that the companionship variable was the only belief measure out of the three wildlife value orientation items included on the non-response check that revealed differences between respondents and non-respondents, further justifying our decision not to weight the data on the basis of this single item.

Descriptive Findings for Wildlife Value Orientations and Barriers

Reliability results indicated high internal consistency for wildlife belief dimension and value orientation scales (Table 2.1; Nunnally & Bernstein, 1994). The four value orientation types (traditionalist, mutualist, pluralist, and distanced) differed significantly in mean scoring on these scales (Table 2.5). Results showed that 37% of respondents were identified as traditionalists, 28% as mutualists, 11% as pluralists, and 24% as distanced. Responses to barriers items indicated that respondents overall did not perceive any major barriers to participation in nature-based programs (Table 2.2). Means for these items were all below the scale midpoint of 4.00, indicating that, on average, respondents disagreed that time, cost, transportation, etc. were an issue for them. However, as indicated by item standard deviations, some variability in scoring could be detected. Correlational analysis revealed significant patterns of association among a number of the barriers items (Table 2.6). Concerns about having children attend programs with staff

they do not know were significantly correlated with other cultural barriers like comfort with leaving children with staff ($r = 0.30, p < 0.01$) and trustworthiness of the agency ($r = 0.22, p < 0.01$), and with the practical barrier of awareness of opportunities ($r = 0.20, p < 0.01$). Additionally, two cultural barriers with a relatively high correlation included trustworthiness of the agency and comfort with leaving children with staff ($r = 0.30, p < 0.01$).

We performed three distinct cluster analyses to test a two, three, and four – group cluster solution with the barriers items. The three-group solution was chosen for subsequent analyses because it resulted in the most intuitively meaningful and homogeneous groups (Table 2.7). The first group in the three-group solution ($n = 95, 34\%$) was more likely to experience culturally-oriented barriers, scoring higher than the other groups on items reflecting concerns about leaving children with staff and having children attend programs with staff they don't know. This group was also slightly likely to indicate a lack of awareness of nature-based program opportunities in the community. The second group ($n = 51, 19\%$) perceived more practically-oriented barriers, scoring higher than the other groups on transportation constraints. Additionally, this group was slightly likely to perceive awareness of program options as a barrier. The third group ($n = 131, 47\%$) did not indicate experiencing any barriers to participation in nature-based programs, as indicated by mean scoring on all barriers items.

Results of comparisons on the open-ended benefit/concern questions did not reveal significant variation across groups. Developing respect and appreciation for nature was the primary benefit of having children participate in nature-based programs for all clusters (32% of group one, 33% of group two, and 34% of group three). Safety was the

primary concern for all clusters (32% of group one, 33% of group two, and 34% of group three).

Exploring the Relationship between Wildlife Value Orientations and Barriers

Results in most cases suggested the lack of a significant relationship between barriers and wildlife value orientations. Correlational results revealed a weak to moderate correlation between the domination value orientation and concerns about having children attend programs with staff they don't know ($r = 0.16, p < 0.01$) and without the parents present ($r = 0.12, p < 0.05$; Table 2.6). Respondents with a higher score on domination were more likely to express these concerns. The mutualism value orientation scale was not significantly correlated with any of the barriers items (Table 2.6). ANOVA results showed that mean responses for only one barrier, time, differed significantly by value orientation type (Table 2.8), with traditionalists ($M = 3.28$) more likely than pluralists ($M = 2.44$) to report this as an issue that interferes with participation in programs about nature. Results of analyses using the three barriers clusters further confirmed the lack of a significant association between barriers and wildlife value orientations. ANOVA results revealed a lack of variation among clusters on mean domination ($F_{2, 274} = 0.21, p = 0.81$) and mutualism ($F_{2, 274} = 1.43, p = 0.24$) scoring. Chi-square test results also showed that the three clusters did not differ significantly by value orientation type ($\chi^2_6 = 3.27, p = 0.78$).

Certain differences were noted among the value orientation types on responses to the open-ended benefit/concern questions. The primary benefit of having children participate in nature-based programs was acquiring knowledge for 30% of traditionalists and 25% of mutualists, and developing respect and appreciation for nature for 38% of

pluralists and 27% of distanced. While the primary concern of participation, safety, did not differ by value orientation type (32% of traditionalists, 33% of pluralists, 34% of mutualists, and 33% of distanced), traditionalists commented more frequently about their concern that their children would be taught views that contradicted their personal beliefs. Example comments included (C = Comment):

C₁: Won't receive a balanced view of how to manage competing needs of environment and business.

C₂: That it will be a program with ulterior motives (global warming scare).

DISCUSSION

The primary purpose of this study was to explore how information on wildlife value orientations and barriers to participation in nature-based programs might be integrated to improve wildlife agency initiatives to connect children and families to nature. Results indicated that there was not much of a relationship between barriers and wildlife-related interests of the respondents, suggesting that these considerations may need to be evaluated separately in thinking about ways to develop more targeted nature-based opportunities in the future. However, given that our sample was relatively homogeneous with respect to its lack of major barriers to participation in program offerings, results also point to the need for additional research to determine if the findings of this study can be applied to other populations and geographic locations.

As stand-alone concepts, barriers and wildlife value orientations have major implications for improving the reach of nature-based programs. Barriers to nature-based program participation have been extensively researched and applied in the context of informing program design (Allison & Hibbler, 2004; Bruyere et al., 2008; Hong & Anderson, 2006; Miller, 2003). Studies have specifically revealed how diverse audiences may differentially experience barriers based on factors such as ethnicity and

sociodemographic characteristics. Past studies have also revealed patterns in barriers item responses, indicating that some people may perceive more practically-oriented barriers whereas others may perceive more culturally-oriented barriers (Bruyere, Gobbs-Hill, & Paulding, 2010). Congruency of cluster analysis results with past findings helps to create a framework that can be used to address barriers conceptually in the future

Similar to the role of the barriers concept in explaining variability among segments of the population, past research on wildlife value orientations has revealed variation in how different audiences relate to wildlife and how an understanding of this diversity can inform wildlife conservation and decision-making (Manfredo et al., 2009; Teel & Manfredo, 2009). However, the value orientation concept has not yet been applied in the context of developing nature-based programs. Given that traditional approaches to natural resource (and wildlife) management have largely been designed to serve the dominant culture, and significant demographic changes are expected in this country by 2050, there is a need to create innovative approaches to connect children and families to nature that can appeal to people from diverse backgrounds, both in terms of their ethnic/demographic characteristics as well as their wildlife-related interests (Bruyere, Teel, & Newman, 2009).

Using Wildlife Value Orientation Theory to Inform Nature-Based Programs

Using wildlife value orientations to inform nature-based programs can assist in the movement to connect children and families to nature by helping wildlife agencies develop more targeted educational initiatives. Wildlife value orientations are good predictors of a person's preference for wildlife-related services and activities (Bright et al., 2000; Fulton et al., 1996; Manfredo et al., 2009; Teel & Manfredo, 2009). For

example, while traditionalists are more likely to engage in recreation activities like hunting and fishing, mutualists are more likely to participate in wildlife viewing. Wildlife value orientations of parents may also determine preferences for nature-based opportunities that their children pursue. For instance, traditionalists may be more likely than mutualists to have their children attend hunter-education classes, given that these classes are more in line with the utilitarian interests of the traditionalist group.

Certain activities for connecting children to nature may appeal to all value orientation types, in which case agencies offering the programs should consider how the educational *content* tied to the activity can be adapted to meet their audience's preferences. Content messages should be framed differentially based on the value orientations of the target population(s). For example, one possible activity for engaging children with nature and with animals could be to take them to a zoo. While all value orientation types may enjoy this activity, animals could be presented and described in a way that is consistent with how the families think about and relate to wildlife. For a primarily traditionalist audience, the animals can be described in terms of how they are used to benefit humans, such as the benefits of bee pollination for agriculture or pest control provided by bats and birds. For an audience of primarily mutualists, the animals can be portrayed in terms of companionship with humans and how humans care for them (e.g., providing housing and food for birds). Animals could be described in both ways for a pluralist audience. Because a distanced audience traditionally identifies with wildlife through indirect experiences, it may be valuable to describe the similarities between wildlife and domestic animals, which are more relevant for this group. The ability of agencies to adapt the activities and messages of nature-based programs for different

audiences will be key to generating broad-based support for future conservation initiatives.

The Need for Future Research

In the face of changing societal conditions, an understanding of wildlife value orientations and barriers to participation in nature-based programs can be useful in considering ways to improve wildlife agencies' educational initiatives to ensure a broader reach. In the future, an application of these concepts could benefit from additional research to further explore their connection (or lack thereof). It is worth noting in this context that certain reasons may explain why we did not detect a strong relationship, besides the possibility that the concepts are in fact unrelated. First, little variation was found in our sample on responses to the barriers items; respondents, on average, did not appear to be affected by practical and cultural influences that have been shown through prior research to limit participation in community programs about nature. This may in turn be due to the demographic homogeneity of our respondents, as sociodemographics are often significant predictors of barriers (Borden et al., 2006; Bruyere et al., 2008; Hong & Anderson, 2006). Based on the target population of interest in this study, our sample reflected a more affluent and urban group of residents living within close proximity to the agency's education center (NCWRC) in Raleigh, North Carolina. The homogeneous nature of our sample may have been a limiting factor in determining whether barriers to participation in nature-based programs are differentially experienced by people with different wildlife-related interests. Another important consideration is whether the lack of a relationship in our findings is due to the general way in which respondents were asked about programs. In other words, because the focus was on

barriers to participation in programs about *nature*, as opposed to programs about *wildlife* more specifically, one could argue that a strong relationship with wildlife value orientations wouldn't necessarily be expected. Additional research is necessary to determine whether our findings can be generalized to other populations/regions and whether a refined focus on programs for connecting children/families to nature that emphasize wildlife-related content would result in different conclusions.

As part of a broader project that inspired this paper, we are currently conducting similar assessments in collaboration with state fish and wildlife agencies in other parts of the country, which will allow for further examination of our study concepts and ideas. These assessments, including the survey we conducted in North Carolina, will be used to design a series of small-scale programs that, through the broader project, will be tested to evaluate their potential for use by participating agencies in the future to connect children and families to nature and appeal to more diverse audiences.

LITERATURE CITED

Allison, M. T., & Hibbler, D. K. (2004). Organizational barriers to inclusion:

Perspectives from the recreation professional. *Leisure Sciences*, 26, 261–280

Borden, L. M., Perkins, F. A., Carleton-Hug, A., Stone, M., & Keith, J. G. (2006).

Challenges and opportunities to Latino youth development: Increasing meaningful participation in youth development programs. *Hispanic Journal of Behavioral Sciences*, 28, 187-208.

Bright, A. D., Manfredi, M. J., & Fulton, D. C. (2000). Segmenting the public: An application of value orientations to wildlife planning in Colorado. *Wildlife Society Bulletin*, 28(1), 218-226.

- Bruyere, B. L., Billingsley, E. D., & O' Day, L. (2008). A closer examination of barriers to participation in informal science education for Latinos and Caucasians. *Journal of Women and Minorities in Science and Engineering*, 15: 1-14.
- Bruyere, B. L., Gobbs-Hill, S., & Paulding, L. (2010, in review). Developing a model to predict participation in informal science education by families in Colorado. *Journal of Learning Environments Research*.
- Bruyere, B., Teel, T., & Newman, P. (2009). Response to "More kids in the woods: Reconnecting Americans with nature." *Journal of Forestry*, 107(7), 378-379.
- Burns, R., Autry, C., & Graefe, A. (2007). Youth focus group interviews: Oregon statewide comprehensive outdoor recreation plan (SCORP).
- Chawla, L. (1988). Children's concern for the natural environment. *Children's Environmental Quarterly*, 5(3), 13-20.
- Chawla, L. (2003). Bonding with the natural world: The roots of environmental awareness. *NAMTA Journal*, 28(1), 133-154.
- Chawla, L. (2007). Participation and the ecology of environmental awareness and action. In A. Reid, B. B. Jensen, J. Nikel and V. Simovska (Eds.), *Participation and the Ecology of Environmental Awareness and Action*. Springer Netherlands.
- Clements, R. (2004). An investigation of the status of outdoor play. *Contemporary Issues of Early Childhood*, 5(1), 46-50.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. (2nd edition). Hillsdale, NJ: Lawrence Erlbaum Associates.

- Cooper, C. R., Jackson, J. F., Azmitia, M., Lopez, E., & Dunbar, M. (1995). Bridging students' multiple worlds: African American and Latino youth in academic outreach programs. In R. F. Macias (Ed.) *Changing schools for changing students: An anthology of research on language minorities* (pp. 211–234). Santa Barbara, CA: University of California Press.
- Dillman, D. A. (2000). *Mail and internet surveys: The tailored design method*. New York: Wiley.
- Fulton, D. C., Manfredi, M. J., & Lipscomb, J. (1996). Wildlife value orientations: A conceptual and measurement approach. *Human Dimensions of Wildlife, 1*, 24-27.
- Hinkley, T., Crawford, D., Salmon, J., Okely, A. D., & Hesketh, K. (2008). Preschool children and physical activity - A review of correlates. *American Journal of Preventive Medicine, 34*(5), 435-441.
- 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.
- Hong, A., & Anderson, D. H. (2006). Barriers to participation for Latino people at Dodge Nature Center. *Journal of Environmental Education, 37*(4), 33–44.
- Kellert, S. R. (2005). *Building for life: Designing and understanding the human – nature connection*. Washington, DC: Island Pres.
- Kimbell, A. R., Schuhmann, A., & Brown, H. (2009). More kids in the woods: Reconnecting Americans with nature. *Journal of Forestry, 107*(7), 373-377.
- Louv, R. (2005). *Last child in the woods: Saving our children from nature-deficit disorder*. Chapel Hill, NC: Algonquin Books.

- Manfredo, M. J., & Teel, T. L. (2008). Integrating concepts: Demonstration of a multi-level model for exploring the rise of mutualism value orientations in post-industrial society (Chapter 8). In M. J. Manfredo, *Who cares about wildlife: Social science concepts for understanding human-wildlife relationships and other conservation issues*. New York: Springer Press.
- Manfredo, M. J., Teel, T. L., & Henry, K. L. (2009). Linking society and environment: A multilevel model of shifting wildlife value orientations in the western United States. *Social Science Quarterly*, *90*, 407-427.
- Miller, B. (2003). *Critical hours: Afterschool programs and educational success*. Quincy, MA: Nellie Mae Foundation.
- Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric Theory* (3rd ed.). New York: McGraw-Hill.
- Pergams, O. R. W., & Zaradic, P. A. (2006). Is love of nature in the US becoming love of electronic media? 16-year downtrend in national park visits explained by watching movies, playing video games, internet use, and oil prices. *Journal of Environmental Management*, *80*(4), 387-393.
- Ponzio, R., & Marzolla, A. M. (2002). Snail trails and science tales: Inventing scientific knowledge. *Canadian Journal of Environmental Education*, *7*(2), 37-43.
- Rideout, S. (2000). Factors limiting minority participation in interpretive programming: A case study. *Journal of Interpretation Research*, *5*(1), 53-58.
- Rivkin, M. S. (1995). *The great outdoors: Restoring children's right to play outside*. Washington, DC: National Association for the Education of Young Children.
- Rokeach, M. (1973). *The nature of human values*. New York: The Free Press.

- Schwartz, S. H. (1992). Universals in the content and structure of values: Theoretical advances and empirical tests in 20 countries. *Advances in Experimental Social Psychology*, 25, 1-65.
- Taylor, A., & Kuo, F. E. (2008). Children with attention deficits concentrate better after walk in the park. *Journal of Attention Disorders* Online First.
DOI:10.1177/1087054708323000.
- Teel, T. L., Dayer, A. A., Manfredi, M. J., & Bright, A. D. (2005). Regional results from the research project entitled "Wildlife Values in the West" (Project Rep. No. 58). Project Report for the Western Association of Fish and Wildlife Agencies. Fort Collins, CO: Colorado State University, Human Dimensions in Natural Resources Unit.
- Teel, T. L., & Manfredi, M. J. (2009). Understanding the diversity of public interests in wildlife conservation. *Conservation Biology*, 24(1), 128-139.
- Teel, T. L., Manfredi, M. J., Jensen, F. S., Buijs, A. E., Fischer, A., Riepe, C., Alinghaus, R., & Jacobs, M. H. (2010, *in press*). Understanding the cognitive basis for human-wildlife relationships as a key to successful protected area management. *International Journal of Sociology*.
- Wells, N. M. (2000). At home with nature: Effects of 'greenness' on children's cognitive functioning." *Environment and Behavior*, 32(6), 775-795.
- Wells, N. M., & Evans, G. W. (2003). Nearby nature: A buffer of life stress among rural children. *Environment and Behavior*, 35(3), 311-330.

Wells, N. M., & Lekies, K. S. (2006). Nature and the life course: Pathways from childhood nature experiences to adult environmentalism. *Children, Youth and Environments, 16*(1) 1-24.

Table 2.1. Reliability results for wildlife value orientations from a 2010 survey of North Carolina residents.

Wildlife value orientation, basic belief dimension, and basic belief item ¹	Cronbach's alpha
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Domination Wildlife Value Orientation	0.80
Appropriate Use Beliefs	0.73
Humans should manage fish and wildlife populations so that humans benefit.	
The needs of humans should take priority over fish and wildlife protection.	
Fish and wildlife are on earth primarily for people to use.	
Hunting Beliefs	0.83
We should strive for a world where there's an abundance of fish and wildlife for hunting and fishing.	
Hunting is cruel and inhumane to the animals. ²	
Hunting does not respect the lives of animals. ²	
People who want to hunt should be provided the opportunity to do so.	
Mutualism Wildlife Value Orientation	0.85
Social Affiliation Beliefs	0.81
We should strive for a world where humans and fish and wildlife can live side by side without fear.	
I view all living things as part of one big family.	
Animals should have rights similar to the rights of humans.	
Wildlife are like my family and I want to protect them.	
Caring Beliefs	0.70
I care about animals as much as I do other people.	
I feel a strong emotional bond with animals.	
I value the sense of companionship I receive from animals.	

¹ Item response scale range: 1 (strongly disagree) to 7 (strongly agree).

² Item was reverse coded prior to analysis.

Table 2.2. Descriptive statistics for barriers to participation in nature-based programs from a 2010 survey of North Carolina residents.

Barriers Item ¹	<i>n</i>	mean (SD)
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My family is too busy to participate in programs about nature.	28 1	3.04 (1.55)
The cost of programs about nature is usually not a problem for my family. ²	28 1	2.76 (1.66)
Transportation to programs about nature is difficult for my family.	28 2	2.29 (1.69)
I am uneasy about having my child in a program where I do not know the staff.	28 1	3.38 (1.73)
I am unaware about programs about nature in my community.	28 0	3.77 (1.73)
I am comfortable having my child at a program about nature without me there. ²	28 1	2.78 (1.60)
My state wildlife agency is a trustworthy source for programs about nature. ²	28 2	2.37 (1.20)

¹ Item response scale range: 1 (strongly disagree) to 7 (strongly agree).

² Item was reverse coded prior to analysis.

Table 2.3. A four-group typology of wildlife value orientations (adapted from Teel et al., 2010).

		Domination	
		High	Low
Mutualism	Low	<p>Traditionalists. Have a domination orientation, believing that wildlife should be used and managed primarily for human benefit. They are more likely to prioritize human well-being over wildlife in their attitudes and behaviors. They are also more likely to find justification for treatment of wildlife in utilitarian terms and to rate actions that result in death or harm to wildlife as acceptable.</p>	<p>Distanced. Do not have either a mutualism or a domination orientation. As their label suggests, they tend to be less interested in wildlife and wildlife-related issues.</p>
	High	<p>Pluralists. Have both a mutualism and a domination value orientation toward wildlife. The influence of the two value orientations is believed to be situationally-contingent, meaning that which of the orientations plays a role is dependent upon conditions of the given issue or situation (Tetlock, 1986). For certain issues, Pluralists are likely to respond in a manner similar to that of Traditionalists, whereas for other issues they may behave more like Mutualists.</p>	<p>Mutualists. Have a mutualism orientation, viewing wildlife as capable of relationships of trust with humans, as if part of an extended family, and as deserving of rights and caring. They are less likely to support actions resulting in death or harm to wildlife, more likely to engage in welfare-enhancing behaviors for individual animals, and more likely to view wildlife in human terms.</p>

Table 2.4. Nonresponse check comparisons from a 2010 survey of North Carolina residents.

	Mean of respondent type		Test Statistic	Effect Size
	Respondent	Non-respondent		
In the past year, my family participated in one or more community programs about nature.	4.00	4.21	0.37	0.03
My family is too busy to participate in programs about nature.	3.04	2.55	4.14*	0.11
The cost of programs about nature is usually not a problem for my family. ¹	2.76	2.02	8.82**	0.26
In general, programs that integrate technology are appealing to my child/children.	5.30	5.73	4.66*	0.12
The needs of humans should take priority over fish and wildlife protection.	3.91	4.25	1.56	0.07
Animals should have rights like humans.	3.40	3.51	.163	0.02
People who want to hunt should be provided the opportunity to do so.	5.25	5.36	.222	0.03
I value the sense of companionship I receive from animals.	5.47	6.72	43.23****	0.34
Number of Children	1.94	2.00	0.18	0.02
Age of Child 1	10.61	10.65	< 0.01	< 0.01
Age of Child 2	9.09	9.61	0.57	0.05
Age of Child 3	7.28	8.17	0.27	0.06
Age of Child 4	6.63	8.50	0.24	0.14
Age of Child 5	1.33	N/A	N/A	N/A
Age of Child 6	1.00	N/A	N/A	N/A
Age of Respondent	45.32	43.82	1.18	0.06
Sex of Respondent ²	57.00%	39.60%	5.41*	0.13

¹ Item was reverse coded prior to analysis.

² Cell entries represent the percentage of males within the sample. Test statistic is on the chi-square distribution; all others are on the *F* distribution. Effect size is phi, as opposed to eta, for this analysis.

* Significant at $p < 0.05$, ** Significant at $p < 0.01$, *** Significant at $p < 0.001$.

Table 2.5. Scoring of wildlife value orientation types on belief dimension and value orientation scales from a 2010 survey of North Carolina residents.

Value orientation and belief dimension ¹	Traditionalist	Pluralist	Mutualist	Distanced
	mean (SD)	mean (SD)	mean (SD)	mean (SD)
Domination	5.49 (0.65)	5.19 (0.61)	3.34 (0.82)	3.84 (0.57)
Appropriate use	4.98 (1.02)	4.55 (1.02)	2.72 (1.12)	3.30 (1.03)
Hunting	6.00 (0.90)	5.83 (0.97)	3.96 (1.18)	4.38 (1.10)
Mutualism	3.36 (0.78)	5.20 (0.48)	5.59 (0.79)	3.81 (0.65)
Social affiliation	3.04 (1.06)	5.17 (0.71)	5.54 (0.92)	3.72 (0.70)
Caring	3.69 (0.90)	5.22 (0.69)	5.64 (0.91)	3.90 (0.89)

¹ Original response scales for items comprising the dimensions and orientations ranged from 1 (strongly disagree) to 7 (strongly agree).

Table 2.6. Correlational analysis results for barriers items and wildlife value orientation scales from a 2010 survey of North Carolina residents.

Barriers items and value orientation scales ¹	1	2	3	4	5	6	7	8	9
1. My family is too busy to participate in programs about nature.	1.00								
2. The cost of programs about nature is usually not a problem for my family. ²	0.04	1.00							
3. Transportation to programs about nature is difficult for my family.	0.08	0.13*	1.00						
4. I am uneasy about having my child in a program where I do not know the staff.	0.08	0.09	0.10	1.00					
5. I am unaware about programs about nature in my community.	0.19**	0.08	0.11	0.20**	1.00				
6. I am comfortable having my child at a program about nature without me there. ²	-0.01	0.20**	-0.04	0.30**	0.08	1.00			
7. My state wildlife agency is a trustworthy source for programs about nature. ²	0.02	0.15*	0.02	0.22**	0.08	0.30**	1.00		
8. Domination Value Orientation	0.02	0.01	-0.05	0.16**	0.07	0.12*	-0.09	1.00	
9. Mutualism Value Orientation	-0.08	0.03	0.07	-0.10	0.01	-0.04	-0.08	-0.57**	1.00

¹ Original response scales for barriers and wildlife value orientation items ranged from 1 (strongly disagree) to 7 (strongly agree).

² Item was reverse coded prior to analysis.

* $p < 0.05$, ** $p < 0.01$.

Table 2.7. Barriers to nature-based programs for three clusters of respondents from a 2010 survey of North Carolina residents.¹

Barriers Items	Cluster 1	Cluster 2	Cluster 3	<i>F</i> -value ²	Eta
	Barriers: Culturally Oriented (<i>n</i> = 95)	Barriers: Practically Oriented (<i>n</i> = 51)	No Barriers (<i>n</i> = 131)		
My family is too busy to participate in programs about nature.	-1.17 ^a	-0.22 ^b	-1.10 ^a	7.67	0.23
The cost of programs about nature is usually not a problem for my family. ³	-0.38 ^a	-0.94 ^a	-1.98 ^b	33.21	0.44
Transportation to programs about nature is difficult for my family.	-1.96 ^a	1.20 ^b	-2.62 ^c	297.46	0.83
I am uneasy about having my child in a program where I do not know the staff.	0.38 ^a	-0.55 ^b	-1.37 ^c	35.02	0.45
I am unaware about programs about nature in my community.	0.19 ^a	0.14 ^a	-0.65 ^b	8.19	0.24
I am comfortable having my child at a program about nature without me there. ³	0.11 ^a	-1.82 ^b	-2.01 ^b	87.89	0.63
My state wildlife agency is a trustworthy source for programs about nature. ³	-0.85 ^a	-1.92 ^b	-2.08 ^b	39.00	0.47

¹ Cell entries are mean scores on a 7-point scale from -3 “strongly disagree” to +3 “strongly agree” (original 1 to 7 response scale recoded). Means with different superscripts across each row are statistically different at $p < 0.05$ using Dunnett’s T3 post-hoc tests.

² All values are statistically significant at $p \leq 0.001$.

³ Item was reverse coded prior to analysis.

Table 2.8. Barriers to nature-based programs by wildlife value orientation type from a 2010 survey of North Carolina residents.

Barriers Items ¹	Traditionalist mean ²	Pluralist mean	Mutualist mean	Distanced mean	F-value	p-value	Eta
My family is too busy to participate in programs about nature.	3.28 ^a	2.44 ^b	2.88 ^{a,b}	3.15 ^{a,b}	2.94	0.034	0.18
The cost of programs about nature is usually not a problem for my family. ³	2.85	2.47	2.97	2.49	1.46	0.225	0.13
Transportation to programs about nature is difficult for my family.	2.30	2.28	2.40	2.15	0.27	0.849	0.05
I am uneasy about having my child in a program where I do not know the staff.	3.57	3.53	3.08	3.37	1.33	0.264	0.12
I am unaware about programs about nature in my community.	3.82	4.03	3.86	3.45	1.13	0.338	0.11
I am comfortable having my child at a program about nature without me there. ³	2.84	2.88	2.70	2.75	0.17	0.914	0.04
My state wildlife agency is a trustworthy source for programs about nature. ³	2.35	2.03	2.40	2.54	1.32	0.269	0.12

¹ Item response scale range: 1 (strongly disagree) to 7 (strongly agree).

² Means with different superscripts across each row are statistically different at $p < 0.05$ using Dunnett's T3 post-hoc tests.

³ Item was reverse coded prior to analysis.

**III. A QUALITATIVE APPROACH TO ASSESSING WILDLIFE VALUE
ORIENTATIONS IN A FOCUS GROUP SETTING**

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INTRODUCTION

Children spend much less time outdoors than children of past generations, a trend that Richard Louv (2005) has termed “nature-deficit disorder.” As nature-based activity continues to decline (Clements, 2004; Rivkin, 1995), children miss various physical, mental, and spiritual benefits gained with time spent outside. Associated health problems of greater time spent indoors include increased attention disorders (Taylor & Kuo, 2008), inability to cope with stress (Wells & Evans, 2003), weight gain (Keeton & Kennedy), and reduced creativity and cognitive development (Kellert, 2005; Wells, 2000). Furthermore, the relationship between time spent outdoors as a child and future commitment to environmental stewardship has natural resource agencies increasingly directing their attention to programs for re-connecting children to nature (Kimbell, Schuhmann, & Brown, 2009). When children have the opportunity to make strong, meaningful connections to nature, they are more likely to engage in pro-environmental behaviors and support conservation goals of natural resource agencies as adults (Chawla 1998, 2003, 2007; Wells & Lekies, 2006). With declining attendance in national parks and participation in outdoor recreation (Pergams & Zeradic, 2006), agency program offerings can help reverse these negative trends. As America continues to become more ethnically diverse, it is important for these programs to engage children and families from a variety of different backgrounds (Bruyere, Teel, & Newman, 2009; Kimbell et al., 2009). However, the reality is that management of natural resources is traditionally rooted in practices designed to serve the dominant culture, a culture that will soon become the minority. Services and educational opportunities will therefore need to be adapted to serve a broader audience.

Recent research on human values toward wildlife in the western United States provides a framework for thinking about ways to improve agencies' educational initiatives in the face of changing societal conditions (Manfredo & Teel, 2008; Manfredo, Teel, & Henry, 2009; Teel, Dayer, Manfredo, & Bright, 2005; Teel & Manfredo, 2009). An important conclusion drawn from this work is the need for tailored approaches from natural resource agencies that readily attend to the diversity of values in contemporary society. Forces of modernization have affected the circumstances of daily life in America in such a way as to stimulate a shift in values toward wildlife. Similar to the more general human-nature divide that Louv describes, findings suggest that as children become removed from direct interaction with wildlife through such changes as urbanization, this can in turn impact how they think about wildlife as adults.

Prior research on human values toward wildlife and the natural environment has relied heavily on the use of quantitative survey methodologies, but new efforts must include innovative ways to obtain input from an ethnically-diverse clientele. Traditional surveys have generally proven ineffective in gathering information from diverse populations, and survey response rates tend to be lower for these audiences (Bruyere et al., 2009, Martinez-Ebers, 1997; Porter & Umbach, 2006; Pottick & Lerman, 1991; Sax, Gilmartin, & Bryant, 2003). Reasons for lower rates of participation that have been identified in the cross-cultural methods literature include difficulty in translating abstract concepts into scaled numerical responses, language barriers, unfamiliarity with the process of mail surveys, and lack of trust in sponsoring organizations or government institutions (Sax et al., 2003). Increasingly, in response to this situation, there is recognition of the need to also consider qualitative approaches, including focus groups

and interviews, which are more successful in obtaining information from diverse groups. Qualitative techniques offer additional advantages over traditional methodologies in being able to obtain more in-depth understanding of human thought and behavior (Martinez-Ebers, 1997; Pottick & Lerman, 1991). To contribute to the use of these approaches in a wildlife- or natural resource-related context, our study was designed to introduce a qualitative technique for wildlife values assessment. The intent in developing this type of approach, which was tested in a focus group setting with diverse audiences in New York City, was to enhance our ability from a research standpoint to obtain wildlife values information from diverse audiences.

Understanding Human Values toward Wildlife

To distinguish among the different types of cognitions that form the basis for human behavior, the cognitive hierarchy, or value-attitude-behavior framework, has been developed (Homer & Kahle, 1988; Manfredo et al., 2009). Values form the basis of the conceptual hierarchy, followed by more specific beliefs, attitudes, norms, and behavioral intentions. Values are basic mental constructs that dictate what an individual deems appropriate “modes of conduct” or desired “end states of existence” (Rokeach, 1973). They are stable, enduring beliefs that transcend specific situations and influence attitudes and behaviors across the broad array of experiences in life (Schwartz, 1992). In contrast, attitudes, which are immediate antecedents to behavior, are more transitional in nature and therefore more likely to be influenced by education and communication efforts. An attitude is an evaluation expressing some degree of favor or disfavor toward an attitude object (e.g., a person, event, or issue; Ajzen & Fishbein, 1980). An attitude is determined by specific beliefs about the attitude object and is also shaped by broader-level cognitions

like values. While attitudes are many, values are relatively few in number because they represent the basic biological and social needs of humans (Rokeach, 1973).

Because values tend to be shared within a culture, they often cannot explain the individual variability in specific attitudes and behaviors that can exist for a given topic area such as wildlife (Bright, Manfredro, & Fulton, 2000). The concept of value orientations has been created to address this gap. Value orientations are arrangements of basic beliefs that provide contextual meaning for values for a topic such as wildlife (Manfredro et al., 2009; Teel & Manfredro, 2009). Through prior work, wildlife value orientations have been shown to predict attitudes toward wildlife-related issues and wildlife-associated recreation behaviors (e.g., Fulton, Manfredro, & Lipscomb, 1996; Teel & Manfredro, 2009).

At a societal level, recent research has indicated that changing conditions associated with modernization (i.e., urbanization, rising income and education levels) have prompted a gradual shift away from a *domination* value orientation toward wildlife and the concurrent rise of a *mutualism* view in the United States (Manfredro et al., 2009). While a domination orientation defines wildlife primarily as a resource to be used and managed for human benefit, a mutualism orientation perceives wildlife as capable of relationships of trust with humans and as life forms deserving of rights and caring. Four different types of people have been identified through this research based on the degree to which they emphasize a domination and/or mutualism orientation in their thinking. The four types include traditionalist, mutualist, pluralist, and distanced (Table 3.1; Teel & Manfredro, 2009). Traditionalists view wildlife in a more utilitarian manner and tend to prioritize human well-being over wildlife. Mutualists are defined by their greater sense of

caring and desire for companionship that they express toward wildlife. Pluralists hold both a domination and a mutualism orientation toward wildlife, and the degree to which each orientation surfaces in their thinking is dependent upon the issue or the situational context. Distanced individuals do not have a well-formed value orientation toward wildlife and tend to be less interested in wildlife and wildlife-related issues. They are also more likely to express concern for safety in relation to wildlife in outdoor settings.

Wildlife value orientations have important implications for wildlife management. For example, hunting is highly supported by those with a domination orientation, while wildlife viewing is a more typical recreation activity for individuals with a mutualism orientation. Knowledge of wildlife value orientations can help agencies identify and better understand groups that may need more adequate representation in agency decisions and outreach efforts, and this information can also be used to develop more targeted agency programs to attend to the diversity of public interests (Teel & Manfredro, 2009).

Qualitative Approaches for Wildlife Values Assessment

Recent studies have employed more qualitative techniques to measure wildlife value orientations. Examples include research exploring the connection between wildlife media and value orientations (Champ, 2002), cross-cultural differences and similarities in value orientations (Dayer, Stinchfield, & Manfredro, 2007), determinants of value orientations (Deruiter & Donnelly, 2002), and urban adolescent experiences with wildlife among diverse populations (Van Velsor & Nilon, 2006). As a part of the Wildlife Values Globally project to increase the geographical reach of wildlife value orientation assessment, Dayer et al. (2007) used a semi-structured interview methodology to examine wildlife value orientations cross-culturally. The methodology was tested in an

exploratory study involving nine countries (Teel, Manfred, & Stinchfield, 2007). The technique consisted of emotional prompts to elicit “stories” about wildlife, realizing that because basic emotions are a universal construct (common to all human societies) their use would allow for responses to be both generated and compared in a cross-cultural context. Furthermore, emotions and cognitions, such as value orientations, are closely linked, making it easy to elicit as well as detect wildlife value orientations using this type of approach.

In addition to interviews, focus groups can be a useful method for gathering qualitative data. A focus group is a group of people that shares certain characteristics and provides input via a discussion format to enhance understanding about a topic of interest (Krueger & Casey, 2000). Focus groups are a unique tool for data collection because they provide a social element, which lacks in many research efforts (Clark, Fly, Buehler, & Evans, 1994). Additional advantages of focus groups over other data collection methods are the ability to probe individuals about values that underlie attitudes as well as the spontaneity produced from social interaction (Morgan, 1996). Group conversation “facilitates and encourages sharing of ideas among participants,” (Minnis, Holsman, Grice, & Payton, 1997, p. 41). Information is also produced from members questioning each other. This information may not be anticipated by the researcher but can be critical for enhancing understanding. However, a weakness of focus groups (as is often the case with other qualitative techniques) is that results are typically not appropriate for generalizing to large populations because of the small number of participants. Elements such as reliability and replicability of findings are sacrificed in exchange for a deeper understanding of the public’s view on relevant topics (DiCamillo, 1995).

Focus groups have been used increasingly in human dimensions of wildlife research (Clark et al., 1994; DiCamillo, 1995; Minnis et al., 1997). Focus groups, like most qualitative approaches, can be an effective technique for reaching out to demographically diverse audiences. In recognition of this, and in response to the need for more information on the wildlife-related interests of diverse populations, the purpose of our study was to design and test a qualitative, focus group approach for measuring wildlife value orientations. Specific objectives were (1) to determine the adequacy of our approach for eliciting wildlife value orientations in a focus group setting and (2) to compare results obtained from our qualitative procedure with those from a traditional survey methodology to further evaluate our new approach.

METHODS

Study Area

Our qualitative approach was tested in focus groups in the inner city of New York City. The focus groups included staff of a nature-based program in NYC and parents whose children attend the program. The existing program is run in partnership with the After School Corporation, Inc. and United Neighborhood House. The program varies slightly from site to site, but the overall goal is to encourage youth to become acquainted with and explore nature in their own neighborhood / backyard, increase their environmental literacy, and create stewardship projects, such as recycling programs (fall project) and a native butterfly garden (spring project) at their after school facilities. Two sites of the program were chosen, the Lower Eastside of Manhattan and the Bronx, to target specific diverse populations for purposes of improving the reach and effectiveness of the program offerings in these areas. The Lower Eastside program has primarily

Chinese-American and Hispanic students and the Bronx program has primarily Hispanic students.

Focus Group Administration Procedures

Four focus groups were conducted in the fall of 2009. Two of the four focus groups consisted of parents whose children were enrolled in the nature-based program. One of these was run in the Lower Eastside with nine females (seven Chinese-American, one African-American, and one Hispanic) and one was run in the Bronx with seventeen Hispanic parents (fifteen females and two males). The remaining two focus groups were conducted with program staff. One was run in the Lower Eastside with eleven Hispanic teachers (nine females and two males), and one was run in the Bronx with fifteen Hispanic teachers (all females). We aimed for a size of eight to 12 participants in each focus group. All focus groups began with a maximum of 13 participants, but additional, unexpected participants stepped in after group discussions had begun. In order to maintain flow of the focus groups and respect participants' time and schedules, we chose not to separate the larger groups into two groups. Recruitment of parents to participate in the focus groups occurred through use of a flyer distributed to parents when they attended the nature-based program orientation. The flyer was handed out by program staff who also provided a brief description of the study and encouraged parents to get involved. As an incentive to participate, parents as well as staff who attended the focus groups were provided with food, childcare, and a small monetary reward. Our approach to assessing wildlife value orientations was pre-tested prior to administration in New York City with two focus groups consisting of Colorado State University staff. The pre-test allowed us to

evaluate the process and the effectiveness of our technique in eliciting wildlife value orientations.

The wildlife value orientation component of our focus groups ran as scheduled for approximately 30-45 minutes in each group. The focus groups contained one moderator and at least two note-takers to maintain an intimate environment where people could share their opinions openly. For the focus group with Bronx parents, a translator was present to assist with any language barriers within the group. For the focus group with Lower Eastside parents, a parent acted as a translator for the other parents. A translator was not necessary for either of the staff focus groups. Before focus group discussions began, the participants were given their monetary compensation and offered food. They were informed that they were free to leave at any time during the focus group without consequence. Data from the focus groups were recorded with permission from participants. Three of the focus groups were recorded, and the Lower Eastside staff focus group was not recorded due to the request of a participant.

Wildlife Value Orientation Assessment

Survey Assessment. To check for consistency of findings between quantitative and qualitative methods and in an attempt to validate conclusions drawn from the focus groups, we asked participants at the beginning of each session to complete a brief quantitative survey consisting of items used in prior wildlife value orientation studies (Table 3.2; Manfredo et al., 2009; Teel & Manfredo, 2009). The survey, available in English and in Spanish, consisted of 14 statements intended to elicit basic beliefs about wildlife and wildlife management. Particular “belief dimensions” revealed through prior research and represented in these statements reflected core areas of thought for each

wildlife value orientation. A domination orientation was designated by two belief dimensions, hunting and appropriate use of wildlife. A mutualism orientation was also indicated by two belief dimensions, caring and social affiliation. Respondents rated their level of agreement with the wildlife belief statements on a scale from 1 = “strongly disagree” to 7 = “strongly agree”. Chinese-American parents did not fill out a quantitative survey because we did not have a Mandarin translation. We considered this a limitation because we were unable to further validate our conclusions drawn from the focus group, but consider the limitation small in light of other quality control measures used.

Photo Assessment. Following the administration of the quantitative survey, focus group participants were shown a set of nine PowerPoint slides, each containing a wildlife-related picture (Figure 3.1). Pictures were purposefully selected to ensure representation of each of the major wildlife belief dimensions identified in prior research (Table 3.2). Some pictures were more specific to a dimension, and some were more general photos of human-wildlife interactions. For example, Photograph 1 was chosen to represent the hunting belief dimension, Photograph 8 to represent appropriate use of wildlife, Photograph 2 to represent caring, and Photograph 3 to represent the social affiliation belief dimension. For each picture, participants were asked to indicate on a written questionnaire (both English and Spanish versions were provided) the extent to which they liked the photograph and the degree to which they could relate to the photograph (two items, each measured on a scale from 1 = “strongly disagree” to 7 = “strongly agree”). This exercise was conducted as an *individual assessment* prior to any group discussion. The Chinese-American parents did not fill out a photo ratings sheet because we did not have a Mandarin translation.

The PowerPoint slides were then shown again from the beginning, one at a time, and participants were asked to discuss the photos as a group (*group assessment*). To prompt discussion, after each picture the moderator asked the participants one or more of the following questions: (1) Do you like or dislike this photo? Why? (2) Can you relate to this photo? (3) How does this photo make you feel? Due to time constraints, not all photos were discussed in some focus groups (Bronx staff and parents). During the focus groups, note-takers recorded main themes that emerged during group discussions. Immediately following the focus groups, the note-takers and moderator debriefed on commonalities they observed.

Data Analysis

Survey Analysis. From data on the quantitative survey, respondents were assigned a score for each belief dimension (e.g., hunting) by taking the mean of all items corresponding to that dimension. Respondents were then assigned a value orientation (e.g. domination) score by calculating the mean of associated belief dimension scores. We then segmented respondents into “value orientation types” (traditionalist, mutualist, pluralist, distanced) based on whether they scored high or low on each orientation (Teel & Manfredi, 2009). High was defined by a score of > 4.50 (scale midpoint for each mean composite), whereas low was defined by a score of ≤ 4.50 .

Photo Analysis. The focus group data were transcribed verbatim from the recordings prior to analysis. Four coders, two of whom were not involved with the focus group procedure and two of whom acted as moderator and/or note-taker in the focus groups, conducted a two-step conceptual content analysis of the comments in the transcriptions. First, comments were coded using the two primary wildlife value

orientations identified from previous quantitative research as a guide (Manfredo et al., 2009; Teel & Manfredo, 2009). Specifically, comments were coded as either “domination”, “mutualism”, or “neither”. Second, we reviewed comments from the transcriptions again to determine the extent to which they could be classified as representing the four wildlife value orientation types identified by prior research (Teel & Manfredo, 2009). We assessed intercoder reliability, or agreement, among the four coders who performed these analyses to be 90%. Results of the coding procedures were then compared against the major themes identified during the focus group note-taking as well as with patterns that emerged from the quantitative value orientation survey. Finally, quotations from the transcriptions were extracted to provide illustrations of key findings.

FINDINGS

Analysis of the questionnaires, transcripts, and notes revealed six key findings: 1) Photographs can elicit wildlife value orientations of diverse participants; 2) Four existing value orientation types could be identified across focus groups; 3) Quality control measures provided validation of qualitative findings; 4) Certain photograph attributes may confound the focus of the discussion; 5) Photographs with an ambiguous context require further explanation from the moderator; and 6) Photographs relevant to participants elicit the strongest emotions in participants.

Key Finding #1. Photographs can elicit wildlife value orientations of diverse participants.

Based on the notes of three independent observers (i.e., note-takers) and one moderator, the approach of using photographs with focus group discussion appears to be a viable strategy to measure value orientations toward nature and wildlife of diverse

groups. Participants in all focus groups had much to say for each photo; in some instances, the moderator had to limit comments in order to respect participants' time. In the 30-45 minute allotted timeframe, groups were typically able to discuss at least four to five of the nine photos. People talked about their emotions in depth, providing rich, thick descriptions about their feelings toward wildlife in reaction to the photographs. Additionally, people were able to make comments in reaction to others' feelings and ideas, representing the merit of spontaneity produced by the social interaction allowed through focus group research. An example of this interaction is illustrated below (P = Participant, M = Moderator):

P₁: Animals don't interfere with us. We interfere with them...we are the ones that are harming. They didn't do any harm to them or the environment. And then we come and we think we have the right to do so. We have the right to say when the population is not balanced of the animals.

P₂: But you have to remember...the population decreased and the wildlife brought back and the life of the fish. So humans help bring back population if it's in danger. So you have to remember that there are natural causes that kill...

During the discussion, participants made numerous statements that researchers could later align with wildlife value orientations, using prior research and theoretical frameworks as a guide.

Key Finding #2. Four existing value orientation types could be identified across focus groups.

The photographs were able to spark discussion and resulted in comments that researchers were able to classify as aligning with specific wildlife value orientation types. For example, in one photo in which waterfowl hunters were situated near a pond

(Photograph 1; Figure 3.1), some comments expressed support for the scenario, illustrated in the following quotes drawn from the three focus groups:

P₃: I liked the picture...they do this to keep a balance in the population, so that's why I don't see anything wrong. It's a sport, but I think they get a license and it has a lot to do with the balance.

P₄: I liked the photo. I'd say that in some places there are animals that are overpopulated.

P₅: We can't forget that we need to eat meat. I'm not saying to endanger the bird or whatever it is, but that's how we began. You hunt for your food; you hunt to survive...you're hunting to feed yourself and your family. I don't see a problem with it.

Comments expressing a preference for photographs with a domination theme, including support for hunting and a sentiment that human actions are “part of the balance” in nature were assigned to the *traditionalist* value orientation type.

On the other hand, many comments indicated great concern about and dislike for the scenario depicted in the photograph mentioned above. As an illustration:

P₆: ...that animal doesn't have the option to defend itself. They're defenseless. They should be able to fight back.

P₇: The animal is nice. We need to protect them because so many people kill them. They kill them. We need to protect them.

Somewhat consistent with these comments, one person expressed the following in reaction to Photograph 2, which depicted a man holding a deer fawn:

P₈: (translated) He sees this picture as the opposite of the other picture in that in the other picture, the people were shooting and didn't care, and then there's this person who cares and seems to be caring for the animals. There are things that have worth in life.

Concerns about violence or harm toward animals, positive sentiments about caring for and nurturing animals, and support for animal rights were all assigned to the *mutualist* value orientation type.

Some participants made comments expressing both a domination and a mutualism orientation in their reactions to the photographs. For example, in response to the photograph depicting an animal rights protest (Photograph 3), one participant said:

P₉: ...I do believe all animals have rights. I wear leather, so in that sense I'm a little...but I do believe animals have the right to live.

P₁₀: Yeah, I kind of agree with what she said, but there are supermarkets. Those animals are grown for us to eat. They're getting the wildlife. We're not going to get the wildlife and take them away and go and destroy and take the peace away from what they know and where they live. If we grow them for us to eat, you know, cows and farms, that's different. These guys here aren't going to get that.

Those comments which expressed a combination of domination and mutualism orientations were aligned with the *pluralist* value orientation type.

Finally, some participants had a difficult time relating to certain scenarios of wildlife, and instead of discussing their feelings toward wildlife, they asked questions about the photos or described what they thought they saw in the photos. In reaction to Photograph 3, for example, one participant commented only about pet and zoo animals, suggesting an inability to relate to wildlife:

P₁₁: I like animal. Yeah, I like animal. The baby dog, ok. I don't like the big dog because it bites some people. And the rabbit. She says the tiger! That's scary! It bites the people. I like the elephant...

Additionally, some participants had strong reactions of fear toward scenarios of wildlife in certain photographs. For example, in a picture depicting a coyote near a park bench (Photograph 4), participants expressed concerns for human safety and uneasiness about the scenario.

P₁₂: ...I wouldn't like any kids to be around there because you don't know if the animal is going to be danger or attack.

P₁₃: I'm scared for my kids because the animal does not know not to get close to the kid. The only thing they know how to do is bite to defend themselves if they think they're going to get hurt.

Comments expressing concerns that would suggest an inability to relate to wildlife and fear for human safety regarding situations involving wildlife were labeled as *distanced*.

Coders experienced varying degrees of difficulty in identifying wildlife orientation types. The four coders agreed that wildlife value orientations were easier to detect among comments than value orientation types in most cases. This may be due to the higher degree of specificity in value orientation types, as it may be more difficult to align a comment with a narrower description. Furthermore, comments that exhibited strong emotions (i.e., comments that seemed more extreme) were easier to classify as being representative of a particular value orientation type. Likewise, traditionalist and mutualist comments were easier to identify than distanced and pluralist. For identifying distanced, coders were at times uncertain whether an inability to relate to a wildlife scenario was due to the actual lack of a connection with wildlife or a fault of the photograph in not being able to elicit strong reactions. Coders experienced difficulty at times in identifying pluralist comments because some participants did not fully elaborate on their feelings to the extent needed to detect both a domination and mutualism orientation with certainty.

Key Finding #3. Quality control measures provided validation of qualitative findings.

Qualitative findings in focus groups were generally congruent with quantitative survey results and observations from note-takers. The quantitative survey results

indicated that all four value orientation types were present in the New York focus groups, consistent with findings from the coding of focus group comments which also detected all four types. Observations from note-takers provided even further context, illustrating which comments from participants were given emphasis and generally accepted or rejected by other participants with physical cues. For example, note-takers and the moderator agreed in a debriefing session following one of the focus groups that primary reactions to Photograph 2 (man holding deer fawn) consisted of comments that seemed to convey a sense of caring for wildlife and in some cases a concern for safety. They agreed that these comments seemed to be more mutualist with some distanced sentiment. The results of the transcription coding were consistent with this overall conclusion. For example, coders identified the following comments as mutualist and distanced, respectively:

P₁₄: I find it ok. I picture it as caring.

P₁₅: I don't know the situation the animal has going on...if it's a bigger animal and it's going to like attack, I don't know. It could attack.

Key Finding #4. Certain photograph attributes may confound the focus of the discussion.

In response to Photographs 1 and 3, some participants made comments in reference to photograph attributes that were unrelated to wildlife or wildlife value orientations. Three note-takers and one moderator agreed that this was problematic, as it turned the focus of the discussion away from wildlife in some cases and resulted in valuable focus group time spent on other items. In particular, respondents were distracted by the rifle in the first photograph depicting hunting. To illustrate:

P₁₆: I don't like it. It's dangerous! The gun! If they can't control it, BOOM!

P₁₇: This picture, I don't like it. The gun, the people over there, BOOM like that. This is not good...

P₁₈: The rifle!

Participants were often distracted by the issue of extremism and protesting conveyed in the third photograph depicting a protest of animal rights. The intent was to elicit responses to the notion of animal rights, yet participants in two focus groups spent time discussing their dislike toward protests and extremism. As an example:

P₁₉: This one the people look angry... they talk too many LALALALA! Don't like the signs. Don't like it.

P₂₀: The way I see some people doing it, I don't relate to it...taking it to the violent side, why do people do this? It's a little too much.

Key Finding #5. Photographs with an ambiguous context require further explanation from the moderator.

Some photographs used in the focus groups had an ambiguous context, causing participants to be confused about their feelings toward the photographs. For instance, the second photograph, depicting a deer fawn held by a man, sparked confusion on the part of many participants. Three note-takers observed that participants were unsure of the context in the photograph, and therefore reported that the photograph caused "mixed" feelings. In all three focus groups, a number of participants indicated that they were uncertain about how to feel without additional information. As an illustration:

P₂₁: I was mixed because I didn't know what was happening to the deer.

P₂₂: I'm neutral because I don't understand it. Was he caring for it or did he just find it?

While this finding could be seen as a potential limitation, it also provided the moderator with an opportunity to explore reactions to multiple hypothetical scenarios for the photograph. This allowed the moderator flexibility in being able to explore possible belief dimensions that the focus group had not yet covered in depth. For example:

M₁: So if it was a deer that was injured, what is your reaction?

M₂: If he was keeping that deer for a pet, what is your reaction?

M₃: OK, what would the circumstance be if you didn't like the photo?

Key Finding #6. Photographs relevant to participants elicit the strongest emotions in participants.

Participants had a difficult time relating to one of the photographs and were unable to discuss their feelings about it. Photograph 7 depicted one buck and one doe deer in an open field – in what might arguably be seen as their native habitat – with no direct evidence of humans or human impacts. Some participants were unable to respond to the photograph at a values-level. Instead, they often simply described what they thought they saw in the photograph or asked questions for further clarification about what the photograph was depicting. To illustrate:

P₂₃: Yeah. This one, the deer looked up at the sun. It's hungry. Looks over here, it's hungry. It's looking over here for the food.

P₂₄: They are alert. They're aware of their surroundings. They look up and alert. They know that something is going on.

P₂₅: Another question. I think this one over here, it might see the people? Maybe it looks at the people?

The majority of comments for this photo were difficult to align with wildlife value orientations. However, it is possible that these comments may also be indicative of the distanced value orientation type, in that participants seemed unable to relate to a ubiquitous wild animal in North America.

DISCUSSION

The main purpose of this research was to test the effectiveness of a qualitative focus group approach in eliciting wildlife value orientations. The approach was successful, illustrated by the general congruence among findings from quantitative survey results, coding of focus group transcriptions, and note-takers' observations. Based on their reactions to situational photographs of wildlife, the comments of focus group participants could be identified as representing a domination and/or mutualism orientation toward wildlife and could further be classified into one of four value orientation types identified by prior research (Manfredo et al., 2009; Teel & Manfredo, 2009). This unique contribution of a qualitative assessment procedure extends the application of well-developed theory and links to a large, previous body of work on wildlife value orientations. Similar to the approach developed by Dayer et al. (2007), the adaptability of this non-traditional technique lends itself to assessments of wildlife value orientations among diverse cultures, thereby enhancing our ability to further understand the relationship between wildlife and humans in future investigations.

Because this approach builds upon prior work, it has many important implications for management. Past research has recognized numerous ways in which wildlife value orientation theory may be utilized by natural resource managers (Manfredo et al., 2009; Teel & Manfredo, 2009, Teel et al., 2010). Application of this theory, for example, can help with realizing the possible disconnect between public values toward wildlife and the culture of an agency, which can in turn aid in addressing the issue of public trust in the agency. Additionally, utilization of this theory can help identify segments of the population (defined by their wildlife-related interests) that may be underrepresented in agency decision-making and assist with development of more targeted agency outreach

efforts to improve relationships and ensure better representation in the future. Information on wildlife value orientations is also useful in being able to anticipate public reactions to agency actions and understand the basis for social conflict over wildlife issues. As our findings suggest, the approach developed in this paper can be used to assess the wildlife value orientations of diverse audiences, helping agencies better understand the needs and interests of traditionally underrepresented groups. More specifically, the approach offers promise in being able to provide the necessary baseline information for informing development of agency initiatives for connecting families from diverse backgrounds with wildlife and nature. As American demographics continue to change and children spend less time outside, it will become increasingly important to target and cater to a diversity of ethnicities and values toward wildlife to help enhance the bond between children and nature (Bruyere et al., 2009; Kimbell et al., 2009).

Future Recommendations

We conclude with a few key recommendations for future application of our approach, based on lessons learned from the New York investigation. When using focus group techniques, researchers should follow guidelines prescribed in the literature (Krueger & Casey, 2000; Morgan, 1996) in order for moderators to maintain control and enable a well-balanced discussion. Two limitations identified by three note-takers in our focus groups included 1) translation issues in both parent focus groups and 2) large group size in the Bronx parents focus group. Having an objective translator is necessary when there are language barriers to ensure that the viewpoints of every individual in the group can be heard and understood. Every comment must be translated to prevent the loss of important insight from participants. The size of the focus group should be between eight

and 12 people to maintain a balance that allows everyone a chance to speak while at the same time ensuring multiple opinions can be captured. Large group sizes are more difficult to facilitate and can result in side conversations that detract from the collective group dynamic and can lead to loss of important information. In our study, certain parts of the transcription from the Bronx parents group were marked as inaudible due to respondents talking over one another. Having multiple measures of quality control to ensure the quality of the data, however, helped to lessen the severity of individual limitations found.

When choosing photographs to elicit wildlife value orientations, ambiguity of context and relevance for participants are two key issues to address. Photographs with ambiguous contexts, as illustrated in our results, allow the moderator to explore how reactions may change in response to different scenarios. The moderator can also choose a particular scenario to pursue based on how the discussion has evolved up to that point. For example, if the moderator has not yet heard any comments that would suggest a traditionalist perspective, he/she might select a scenario that represents a more domination-oriented theme. However, the trade-off is that valuable time for discussion can be lost as the hypothetical contexts are explained. To address this concern, the moderator should attempt to anticipate which photographs may require further explanation and be prepared to provide multiple scenarios up front.

Additionally, relevance is another essential consideration in selecting photographs. The extent to which photographs are appropriate for the cultural background and geographic location of the target audience can affect how readily participants are able to react (positively or negatively) to the photographs. However,

photographs that seek to maximize relevance may cause researchers to lose out on the ability to adequately detect a distanced sentiment. For example, in our study, it was useful to discover that participants in the New York focus groups were unable to identify with a photograph of deer, a common wild animal found throughout North America. Interestingly, when the same photograph was shown to Colorado residents during the pretesting phase of this study, it was useful in eliciting domination and mutualism wildlife value orientations. Nevertheless, certain wildlife and human-wildlife interactions may be more appropriate for specific locations and/or cultural groups. To illustrate, as part of a larger project to inform strategies for connecting children to nature, we recently applied our focus group approach to assess wildlife value orientations of native Hawaiians. For this application, we included images of wildlife from the islands that were known to represent important traditions in the native Hawaiian culture. This subset of photographs was useful in providing participants with a relevant context in which they could respond to wildlife-related issues.

Results of the Hawaii case study have helped to demonstrate the adaptability of our qualitative approach for use in other settings and with other cultural groups. Combined with the findings from our New York investigation, these results suggest that future applications of our methodology that can attend to the issues and recommendations outlined above will be a useful tool for assessing wildlife value orientations cross-culturally and among diverse audiences.

LITERATURE CITED

- Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior*. Englewood Cliffs, NJ: Prentice-Hall.
- Bright, A. D., Manfredi, M. J., & Fulton, D. C. (2000). Segmenting the public: An application of value orientations to wildlife planning in Colorado. *Wildlife Society Bulletin*, 28(1), 218-226.
- Bruyere, B., Teel, T., & Newman, P. (2009). Response to "More kids in the woods: Reconnecting Americans with nature." *Journal of Forestry*, 107(7), 378-379.
- Champ, J. G. (2002). A culturalist-qualitative investigation of wildlife media and value orientations. *Human Dimensions of Wildlife*, 7, 273-286.
- Chawla, L. (1988). Children's concern for the natural environment. *Children's Environmental Quarterly*, 5(3), 13-20.
- Chawla, L. (2003). Bonding with the natural world: The roots of environmental awareness. *NAMTA Journal*, 28(1), 133-154.
- Chawla, L. (2007). Participation and the ecology of environmental awareness and action. In A. Reid, B. B. Jensen, J. Nikel and V. Simovska (Eds.), *Participation and the Ecology of Environmental Awareness and Action*. Springer Netherlands.
- Clark, B. N., Fly, J. M., Buehler, D. A., & Evans, R. M. (1994). Focus group interviewing for human dimensions of wildlife research. *Proceedings of the Annual Conference of the Southeast Association of Fish and Wildlife Agencies*, 48, 604-611.
- Clements, R. (2004). An investigation of the status of outdoor play. *Contemporary Issues of Early Childhood*, 5(1), 46-50.

- Dayer, A. A., Stinchfield, H. M., & Manfredo, M. J. (2007). Stories about wildlife: Developing an instrument for identifying wildlife value orientations cross-culturally. *Human Dimensions of Wildlife, 12*, 307-315.
- Deruiter, D. S., & Donnelly, M. P. (2002). A qualitative approach to measuring determinants of wildlife value orientations. *Human Dimensions of Wildlife, 7*, 251-271.
- DiCamillo, J. A. (1995). Focus groups as a tool for fish and wildlife management: A case study. *Wildlife Society Bulletin, 23*(4), 616-620.
- Fulton, D. C., Manfredo, M. J., & Lipscomb, J. (1996). Wildlife value orientations: A conceptual and measurement approach. *Human Dimensions of Wildlife, 1*, 24-27.
- 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.
- Kimbell, G., Schuhmann, A., & Brown, H. (2009). More kids in the woods: Reconnecting Americans with nature. *Journal of Forestry, Journal of Forestry, 107*(7), 373-377.
- Keeton, V. F., & Kennedy, C. (2009). Update on physical activity including special needs populations. *Current Opinion in Pediatrics, 21*(2), 262-268.
- Kellert, S. R. (2005). *Building for life: Designing and understanding the human – nature connection*. Washington, DC: Island Pres.
- Krueger, R. A., & Casey, M. A. (2000). *Focus groups: A practical guide to research* (3rd ed.). Thousand Oaks, CA: Sage Publications.
- Louv, R. (2005). *Last child in the woods: Saving our children from nature-deficit disorder*. Chapel Hill, NC: Algonquin Books.

- Manfredo, M. J., & Teel, T. L. (2008). Integrating concepts: Demonstration of a multi-level model for exploring the rise of mutualism value orientations in post-industrial society (Chapter 8). In M. J. Manfredo, *Who cares about wildlife: Social science concepts for understanding human-wildlife relationships and other conservation issues*. New York: Springer Press.
- Manfredo, M. J., Teel, T. L., & Henry, K. L. (2009). Linking society and environment: A multilevel model of shifting wildlife value orientations in the western United States. *Social Science Quarterly*, *90*, 407-427.
- Martinez-Ebers, V. (1997). Using monetary incentives with hard-to-reach populations in panel surveys. *International Journal of Public Opinion Research*, *9*: 77-86.
- Minnis, D. L., Holsman, R. H., Grice, L., Payton, R. B. (1997). Focus groups as a human dimensions research tool: Three illustrations for their use. *Human Dimensions of Wildlife*, *2*(4), 40-49.
- Morgan, D. L. (1996). Focus groups. *Annual Review of Sociology*, *22*, 129-152.
- Pergams, O. R. W., & Zaradic, P. A. (2006). Is love of nature in the US becoming love of electronic media? 16-year downtrend in national park visits explained by watching movies, playing video games, internet use, and oil prices. *Journal of Environmental Management*, *80*(4), 387-393.
- Porter, S. R., & Umbach, P. D. (2006). Student survey response rates across institutions: Why do they vary? *Research in Higher Education*, *47*: 229-247.
- Pottick, K. J., & Lerman, P. (1991). Maximizing survey response rates for hard-to-reach inner-city populations. *Social Science Quarterly*, *72*: 172-180.

- Rivkin, M. S. (1995). *The great outdoors: Restoring children's right to play outside*. Washington, DC: National Association for the Education of Young Children.
- Rokeach, M. (1973). *The nature of human values*. New York: The Free Press.
- Sax, L. J., Gilmartin, S. K., & Bryant, A. N. (2003) Assessing response rates and nonresponse bias in web and paper surveys. *Research in Higher Education*, 44(4), 409-432.
- Schwartz, S. H. (1992). Universals in the content and structure of values: Theoretical advances and empirical tests in 20 countries. *Advances in Experimental Social Psychology*, 25, 1-65.
- Taylor, A., & Kuo, F. E. (2008). Children with attention deficits concentrate better after walk in the park. *Journal of Attention Disorders* Online First. DOI:10.1177/1087054708323000.
- Teel, T. L., Dayer, A. A., Manfredo, M. J., & Bright, A. D. (2005). Regional results from the research project entitled "Wildlife Values in the West" (Project Rep. No. 58). Project Report for the Western Association of Fish and Wildlife Agencies. Fort Collins, CO: Colorado State University, Human Dimensions in Natural Resources Unit.
- Teel, T. L., & Manfredo, M. J. (2009). Understanding the diversity of public interests in wildlife conservation. *Conservation Biology*, 24(1), 128-139.
- Teel, T. L., Manfredo, M. J., Jensen, F. S., Buijs, A. E., Fischer, A., Riepe, C., Alinghaus, R., & Jacobs, M. H. (2010, *in press*). Understanding the cognitive basis for human-wildlife relationships as a key to successful protected area management. *International Journal of Sociology*.

- Teel, T. L., Manfredi, M. J., & Stinchfield, H. M. (2007). The need and theoretical basis for exploring wildlife value orientations cross-culturally. *Human Dimensions of Wildlife, 12*, 297-305.
- Van Velsor, S. W. & Nilon, C. H. (2006). A qualitative investigation of the urban African-American and Latino adolescent experience with wildlife. *Human Dimensions of Wildlife, 11*, 359-370.
- Wells, N. M. (2000). At home with nature: Effects of 'greenness' on children's cognitive functioning." *Environment and Behavior, 32*(6), 775-795.
- Wells, N. M., & Evans, G. W. (2003). Nearby nature: A buffer of life stress among rural children. *Environment and Behavior, 35*(3), 311-330.
- Wells, N. M., & Lekies, K. S. (2006). Nature and the life course: Pathways from childhood nature experiences to adult environmentalism. *Children, Youth and Environments, 16*(1) 1-24.

Table 3.1. A four-group typology of wildlife value orientations (adapted from Teel et al., 2010).

		Domination	
		High	Low
Mutualism	Low	<p>Traditionalists. Have a domination orientation, believing that wildlife should be used and managed primarily for human benefit. They are more likely to prioritize human well-being over wildlife in their attitudes and behaviors. They are also more likely to find justification for treatment of wildlife in utilitarian terms and to rate actions that result in death or harm to wildlife as acceptable.</p>	<p>Distanced. Do not have either a mutualism or a domination orientation. As their label suggests, they tend to be less interested in wildlife and wildlife-related issues.</p>
	High	<p>Pluralists. Have both a mutualism and a domination value orientation toward wildlife. The influence of the two value orientations is believed to be situationally-contingent, meaning that which of the orientations plays a role is dependent upon conditions of the given issue or situation (Tetlock, 1986). For certain issues, Pluralists are likely to respond in a manner similar to that of Traditionalists, whereas for other issues they may behave more like Mutualists.</p>	<p>Mutualists. Have a mutualism orientation, viewing wildlife as capable of relationships of trust with humans, as if part of an extended family, and as deserving of rights and caring. They are less likely to support actions resulting in death or harm to wildlife, more likely to engage in welfare-enhancing behaviors for individual animals, and more likely to view wildlife in human terms.</p>

Table 3.2 Wildlife Value Orientation Items

Wildlife value orientation, basic belief dimension, and basic belief item ¹

Domination Wildlife Value Orientation

Appropriate Use Beliefs

- Humans should manage fish and wildlife populations so that humans benefit.
- The needs of humans should take priority over fish and wildlife protection.
- Fish and wildlife are on earth primarily for people to use.

Hunting Beliefs

- We should strive for a world where there's an abundance of fish and wildlife for hunting and fishing.
- Hunting is cruel and inhumane to the animals.
- Hunting does not respect the lives of animals.
- People who want to hunt should be provided the opportunity to do so.

Mutualism Wildlife Value Orientation

Social Affiliation Beliefs

- We should strive for a world where humans and fish and wildlife can live side by side without fear.
- I view all living things as part of one big family.
- Animals should have rights similar to the rights of humans.
- Wildlife are like my family and I want to protect them.

Caring Beliefs

- I care about animals as much as I do other people.
- I feel a strong emotional bond with animals.
- I value the sense of companionship I receive from animals.

¹ Item response scale range: 1 (strongly disagree) to 7 (strongly agree).

Figure 3.1. Photographs used in focus group presentations to elicit wildlife value orientations.

Photograph 1



Photograph 2



Photograph 3



Photograph 4



Photograph 5



Photograph 6



Figure 3.1 continued. Photographs used in focus group presentations to elicit wildlife value orientations.

Photograph 7



Photograph 8



Photograph 9



IV. CONCLUSIONS

The purpose of this thesis was to enhance the ability of state fish and wildlife agencies to connect children to nature. In particular, our interest was in exploring how information on barriers and wildlife value orientations could be used to enhance the reach and effectiveness of agencies in connecting children to nature. Information collected in the investigation was useful in expanding what we know about barriers toward participation in nature-based programs and understanding further applications of the wildlife value orientation concept in management. The first paper was guided by theory on barriers to participation and wildlife value orientations to explore the relationship between the two concepts. The second paper applied wildlife value orientation theory and focused on the development of a qualitative methodology to assess wildlife value orientations in a focus group setting. Although each paper examined a specific issue and used different methodologies, the results can be combined to enhance agency efforts to connect children to nature.

Previous research reported in environmental education literature has highlighted the importance of expanding participation of all ethnicities in nature-based programs through knowledge of barriers to participation (Allison & Hibbler, 2004; Bruyere, Billingsley, & O'Day, 2008; Hong & Anderson, 2006; Miller, 2003). These previous studies have shown how barriers differ by sociodemographics and have resulted in recommendations on how to overcome barriers. While barriers have been extensively researched in this context, no literature could be found on how wildlife value orientations information may help reach out to diverse audiences in nature-based programs. In recognition of these gaps in the literature, this study sought to explore the relationship between barriers to participation in nature-based programs and wildlife value orientations

in order to help create more targeted programs that appeal to a broad array of ethnicities and wildlife interests. It also sought to explore a qualitative methodology for exploring wildlife value orientations in a focus group setting. In particular, we examined how to elicit wildlife value orientations through the use of photographs depicting various scenarios of wildlife and humans. Our goal in developing such a focus group methodology was to better understand diverse audiences that have been underrepresented in past research (using a traditional quantitative survey methodology; Manfredo, Teel, & Henry, 2009; Teel & Manfredo, 2009). In particular, we sought to examine how a focus group methodology for assessing wildlife value orientations could provide information that could ultimately aid in improving the relevance of nature-based programs for diverse audiences.

Summary and Integration of Findings

Chapter II explored the possibility of a relationship between barriers to participation and wildlife value orientations. Results indicated that there was not much of a relationship between barriers and wildlife-related interests of the respondents, suggesting that these considerations may need to be evaluated separately in thinking about ways to develop more targeted nature-based opportunities in the future. However, given that our sample was relatively homogeneous with respect to its lack of major barriers to participation in program offerings, results also point to the need for additional research to determine if findings can be applied to other populations and geographic locations.

The study presented in Chapter III utilized prior research and theory on wildlife value orientations (Dayer, Stinchfield, & Manfredo, 2007; Teel, Manfredo, & Stinchfield,

2007) to develop a qualitative methodology to assess wildlife value orientations in a focus group setting. The intent of the study was to develop an instrument that would elicit thoughts about wildlife for participants of various cultures, ethnicities, backgrounds, and wildlife interests. In support of previous findings in the use of a qualitative methodology to assess wildlife value orientations (Dayer et al., 2007), the current study found that a qualitative approach was successful in eliciting wildlife value orientations cross-culturally. In the focus groups, photographs were used to inspire thoughts about wildlife, leading to a values-based discussion on wildlife. Four wildlife value orientation types recognized in previous literature (Manfredo et al., 2009; Teel & Manfredo, 2009) were identified among participants based on their comments. Limitations were discovered in attributes of certain photographs, such as confounding factors, ambiguous context, and the potential lack of cultural relevance.

Overall, results from Chapter II suggested a need for additional research in exploring the possible relationship between wildlife value orientations and barriers to participation in nature-based programs. Results of Chapter III described the successful development of a qualitative approach for evaluating wildlife value orientations in a focus group setting. Results from both studies suggest that it is possible to cater to a diverse audience in nature-based programs through consideration of barriers to participation and wildlife value orientations. Results of this investigation contribute to thinking about ways to help connect children to nature, addressing the need to reach out to diverse audiences as the sociodemographics of America shift in time. This kind of information will be important to consider in future decisions about advertising and designing nature-based programs.

Management Implications

While management implications for barriers toward participation in nature-based programs have been reviewed in past literature, those for using wildlife value orientations to inform nature-based educational programs have not. Information on wildlife value orientations can help agencies design better programs that can adequately attend to the different wildlife-related interests of the public, making the programs more relevant and appealing to agencies' constituents. Nature-based programs can be adapted in this context based on the activities or the educational messages they emphasize, with detailed examples provided in Chapter II. The ability of agencies to cater to a diversity of ethnicities and wildlife-related interests in nature-based programs will likely impact their effectiveness in connecting children from diverse backgrounds to nature and promoting a sense of environmental stewardship among these audiences in the future.

Wildlife value orientations have traditionally been assessed by quantitative measures, leaving many groups that are uncomfortable with this assessment underrepresented. However, the development of a qualitative focus group methodology equips agencies with a convenient tool to gather input on wildlife issues from diverse constituents that would typically be left out of human dimensions research. As the sociodemographics of America continue to change, it will be important for agencies to continue to come up with innovative ways to gather public input and provide nature-based programs for children that can appeal to a changing nation's needs (Bruyere, Teel, & Newman, 2009; Kimbell, Schuhmann, & Brown, 2009).

LITERATURE CITED

- Allison, M. T., & Hibbler, D. K. (2004). Organizational barriers to inclusion: Perspectives from the recreation professional. *Leisure Sciences, 26*, 261–280
- Borden, L. M., Perkins, F. A., Carleton-Hug, A., Stone, M., & Keith, J. G. (2006). Challenges and opportunities to Latino youth development: Increasing meaningful participation in youth development programs. *Hispanic Journal of Behavioral Sciences, 28*, 187-208.
- Bruyere, B. L., Billingsley, E. D., & O' Day, L. (2008). A closer examination of barriers to participation in informal science education for Latinos and Caucasians. *Journal of Women and Minorities in Science and Engineering, 15*: 1-14.
- Bruyere, B., Teel, T., & Newman, P. (2009). Response to “More kids in the woods: Reconnecting Americans with nature.” *Journal of Forestry, 107*(7), 378-379.
- Dayer, A. A., Stinchfield, H. M., & Manfredi, M. J. (2007). Stories about wildlife: Developing an instrument for identifying wildlife value orientations cross-culturally. *Human Dimensions of Wildlife, 12*, 307-315.
- Hong, A., & Anderson, D. H. (2006). Barriers to participation for Latino people at Dodge Nature Center. *Journal of Environmental Education, 37*(4), 33–44.
- Kimbell, G., Schuhmann, A., & Brown, H. (2009). More kids in the woods: Reconnecting Americans with nature. *Journal of Forestry, Journal of Forestry, 107*(7), 373-377.
- Manfredi, M. J., Teel, T. L., & Henry, K. L. (2009). Linking society and environment: A multilevel model of shifting wildlife value orientations in the western United States. *Social Science Quarterly, 90*, 407-427.

- Miller, B. (2003). *Critical hours: Afterschool programs and educational success*. Quincy, MA: Nellie Mae Foundation.
- Teel, T. L., & Manfredi, M. J. (2009). Understanding the diversity of public interests in wildlife conservation. *Conservation Biology*, 24(1), 128-139.
- Teel, T. L., Manfredi, M. J., & Stinchfield, H. M. (2007). The need and theoretical basis for exploring wildlife value orientations cross-culturally. *Human Dimensions of Wildlife*, 12, 297-305.

APPENDIX A. SURVEY INSTRUMENT



Nature Survey for North Carolina’s Youth and Families

The North Carolina Wildlife Resources Commission in collaboration with Colorado State University is interested in your thoughts about your family’s interest in programs about nature. Please answer the following questions to the best of your ability.

1. To what extent do you believe your child/children are interested in the following: **(Circle one number per item)**

	<i>Not at all Interested</i>			<i>Neither</i>			<i>Extremely Interested</i>		
Nature	1	2	3	4	5	6	7		
Wildlife	1	2	3	4	5	6	7		
Fish	1	2	3	4	5	6	7		
Technology (examples: video games, internet)	1	2	3	4	5	6	7		

2. While your responses to the following questions may differ depending on specific circumstances, please respond based on your **general** opinion. Please note that this survey refers to programs in the community such as those that occur at parks, zoos and science centers. **(Circle one number per statement)**

	<i>Strongly Disagree</i>			<i>Neither</i>			<i>Strongly Agree</i>		
In the past year, my family has spent a <u>significant amount of time in nature</u> .	1	2	3	4	5	6	7		
In the past year, my family participated in <u>one or more community programs</u> about nature.	1	2	3	4	5	6	7		
My family is too busy to participate in programs about nature.	1	2	3	4	5	6	7		
The cost of programs about nature is usually not a problem for my family.	1	2	3	4	5	6	7		
Transportation to programs about nature is difficult for my family.	1	2	3	4	5	6	7		
I am uneasy about having my child in a program where I do not know the staff.	1	2	3	4	5	6	7		
I am unaware about programs about nature in my community.	1	2	3	4	5	6	7		
I am comfortable having my child at a program about nature without me there.	1	2	3	4	5	6	7		
My state wildlife agency is a trustworthy source for programs about nature.	1	2	3	4	5	6	7		
I intend for my family to attend a program about nature in the next 6 months.	1	2	3	4	5	6	7		

3. Please respond based on how the following would **generally** influence the likelihood of your family participating in a community program about nature. **(Circle one number per statement)**

	Much less likely to participate			No effect	Much more likely to participate		
	1	2	3	4	5	6	7
Programs that occur on weekends	1	2	3	4	5	6	7
Programs in which the whole family attends	1	2	3	4	5	6	7
After-school programs	1	2	3	4	5	6	7
Programs that occur near my neighborhood	1	2	3	4	5	6	7
Programs that expose my children to future career opportunities	1	2	3	4	5	6	7
Programs that occur when school is out of session	1	2	3	4	5	6	7

4. Thinking about possible options for community programs about nature, how appealing do you think each of the following would be to your child/children? **(Circle one number per statement)**

	<i>Not at all Appealing</i>			<i>Neither</i>	<i>Extremely Appealing</i>		
	1	2	3	4	5	6	7
In general, programs that integrate technology	1	2	3	4	5	6	7
a) Programs that include GPS technology	1	2	3	4	5	6	7
b) Programs about how scientists track wildlife	1	2	3	4	5	6	7
c) Programs that include nature photography	1	2	3	4	5	6	7

5. For programs labeled a through c in question 4 on the previous page, which program do you think your child/children would be most interested in? **(write one letter)** _____

For questions 6-8, please provide a short answer in the space provided.

6. What is the **one best way** to inform you about nature programs for youth and family in your community?

7. What is the **best benefit** you can think of for your children to participate in programs about nature?

8. What is the **greatest concern** you have about your children participating in programs about nature?

9. Below are statements representing different ways that people might think about fish and wildlife. We're interested in knowing your views about fish and wildlife. **(Circle one number per statement)**

	<i>Strongly Disagree</i>	<i>Neither</i>	<i>Strongly Agree</i>
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Humans should manage fish and wildlife populations so that humans benefit.	1	2	3	4	5	6	7
Animals should have rights similar to the rights of humans.	1	2	3	4	5	6	7
We should strive for a world where there's an abundance of fish and wildlife for hunting and fishing.	1	2	3	4	5	6	7
I view all living things as part of one big family.	1	2	3	4	5	6	7
Hunting does not respect the lives of animals.	1	2	3	4	5	6	7
I feel a strong emotional bond with animals.	1	2	3	4	5	6	7
The needs of humans should take priority over fish and wildlife protection.	1	2	3	4	5	6	7

I care about animals as much as I do other people.	1	2	3	4	5	6	7
Fish and wildlife are on earth primarily for people to use.	1	2	3	4	5	6	7
Hunting is cruel and inhumane to the animals.	1	2	3	4	5	6	7
We should strive for a world where humans and fish and wildlife can live side by side without fear.	1	2	3	4	5	6	7
I value the sense of companionship I receive from animals.	1	2	3	4	5	6	7
Wildlife are like my family and I want to protect them.	1	2	3	4	5	6	7
People who want to hunt should be provided the opportunity to do so.	1	2	3	4	5	6	7

10. How many total children under 18 do you have? Include step-children or other children if you provide at least 50% guardianship/custody. _____

11. Please indicate the ages of all of your children under the age of 18.

_____ Child 1 _____ Child 2 _____ Child 3 _____ Child 4 _____ Child 5 _____ Child 6

12. Please indicate your ethnicity/race. **(Check all that apply)**

- Hispanic / Latino Native American
- Caucasian Asian
- African-American Pacific Islander
- Other: _____

13. What is your approximate annual household income before taxes? **(Check one)**

- Less than \$10,000 \$35,000 – 49,999 \$100,000 – 149,999
- \$10,000 – 24,999 \$50,000 – 74,999 \$150,000 – 199,999
- \$25,000 – 34,999 \$75,000 – 99,999 \$200,000 or more

14. What is the highest level of education that you have received? **(Check one)**

- Less than high school diploma 4-year college degree
- High school diploma or equivalent (GED) Advanced degree beyond 4-year college degree
- 2-year associates degree or trade school

15. Are you? Male Female

16. What is your age? _____

17. We may be interested in gathering further input from parents about nature programs for children. Toward this end, we would like to know if you would be interested in providing input in the future by way of mail or email. If so, **please print your name and mailing address and/or email on a separate sheet of paper** and return it along with your completed survey.

Thank you for participating in this study!