

WHALE WATCHERS' PAST EXPERIENCE, VALUE ORIENTATIONS, AND AWARENESS OF CONSEQUENCES OF ACTIONS ON THE MARINE ENVIRONMENT

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This article examines whale watchers' environmental value orientations, experience in relation to whales and the marine environment, and awareness of consequences of their behavior on whales and their habitat. Data were obtained from surveys of 229 shore-based whale watchers in Oregon (USA). Respondents believed that whales and marine areas are important and require protection, and their daily actions affect them and their habitat. Many respondents visited the ocean and watched programs about whales and marine ecosystems; few volunteered or donated to related causes. Structural equation models showed that experienced viewers had stronger biocentric value orientations and were more aware of consequences of their behavior. Value orientations mediated effects of experience on awareness of consequences.

Key words: Value orientations; Experience; Awareness of consequences; Norm activation; Whale watching

Introduction

In the past few decades, whale watching has experienced rapid growth both economically and in popularity, generating over US\$1 billion in annual revenue worldwide through expenditures on tours, accommodation, souvenirs, and related items (Hoyt, 2001; Hoyt & Hvenegaard, 2002; Muloin, 1998, 2000). Each year, more than 9 million people participate in whale watching in over 87 coun-

tries, and participation in this activity is predicted to increase by 3–4% per year (Finkler & Higham, 2004; Hoyt, 2001). In many countries, whale watching occurs primarily from boats. Shore-based viewing, however, is becoming popular, and tourist expenditures have a substantial impact on revenue (Finkler & Higham, 2004). In Oregon (USA), for example, shore-based whale watching generates over US\$1.9 million and attracts more than 126,000 participants each year, which is twice the number

of boat-based whale watchers in the state (Hoyt, 2001). Research has shown that compared to boat-based whale watchers, those viewing from shore are often more sensitive to impacts of the activity. Shore-based viewers, for example, are often more likely to be concerned about the potential for whale watching to disturb whales (Baird, Otis, & Osborne, 1998; Findlay, 1997; Finkler & Higham, 2004; Muloin, 2000).

Although whale watching is typically considered to be a form of nonconsumptive wildlife-oriented tourism, research has revealed biophysical impacts of this activity on the targeted species such as disruption to feeding, resting, and courtship behavior (e.g., Corkeron, 1995; Jelinski, Krueger, & Duffus, 2002; Osborne, 1986; Richter, Dawson, & Slooten, 2006). Comparatively less research, however, has focused on the human dimensions of whale watching (Duffus, 1996; Duffus & Dearden, 1993; Hoyt & Hvenegaard, 2002; Orams, 2000; Parsons, Lück, & Lewandowski, 2006). Research has mainly examined whale watchers' economic expenditures (e.g., Findlay, 1997; Orams, 2001), trip expectations and satisfaction (e.g., Andersen & Miller, 2006; Malcolm, Duffus, & Rollins, 2002), and attitudes toward social and biophysical impacts of the activity (e.g., Finkler & Higham, 2004; Muloin, 2000). This article provides further insights into the human dimensions of whale watching by examining shore-based whale watchers': (a) environmental value orientations (e.g., biocentric or nature-centered versus anthropocentric or human-centered beliefs), (b) awareness of consequences (e.g., awareness of effects of human actions on whales and their habitat), and (c) past experiences (e.g., watching television programs or reading books about whales).

Study Context

In general, whale-watching tours and related programs often provide information and education about marine, wildlife, and conservation issues. In Oregon, for instance, the "Whale Watching Spoken Here" program is offered to shore-based whale watchers. This program is free of charge, whereas tourists typically pay to participate in boat-based whale watching tours. Every year, Oregon Parks and Recreation Department offers this

program at 28 sites along the Oregon coast during the last week of March and December. These times coincide with the spring and winter breaks for Oregon schools, and some of the best times to view gray whales (*Eschrichtius robustus*) migrating along the Pacific Coast, which is the target species for many shore-based whale watchers in Oregon.

This program is carried out by volunteers (i.e., docents) who receive annual training to educate participants about whales and the marine environment. Docents carry binoculars and spotting scopes, small collections of artifacts (e.g., models, baleen, food samples), and printed materials to use when communicating with visitors. Docents informally interact with visitors by asking and answering questions, explaining how to spot whales, pointing out locations and times of whale sightings, showing artifacts, and providing information about the marine environment, whales, and other local wildlife. Approximately 25% of Oregon's shore-based whale watchers participate in this program (Christensen, Rowe, & Needham, 2007). Environmental educators believe that these types of programs and tours can: (a) influence visitors' experiences and perceptions of the natural environment and wildlife species targeted by these programs, and (b) encourage responsible environmental behavior (Manfredo, 2002).

Studies in the environmental education literature have identified factors that influence responsible environmental behavior such as knowledge, attitudes, locus of control, responsibility, and verbal commitment (e.g., Hines, Hungerford, & Tomera, 1986; Hwang, Kim, & Jeng, 2000). The social psychology literature has demonstrated that similar factors including past experience, value orientations, awareness of consequences, attitudes, and intentions directly or indirectly influence an individual's behavior (e.g., Fishbein & Ajzen, 1975; Fulton, Manfredo, & Lipscomb, 1996; Hammitt, Backlund, & Bixler, 2004; Muloin, 1998, 2000; Schreyer, Lime, & Williams, 1984; Schwartz, 1977; Stern & Dietz, 1994; Vaske & Donnelly, 1999). Schreyer et al. (1984) and Hammitt et al. (2004), for example, showed that past experiences influence attitudes and perceptions. Many models suggest that these attitudes and perceptions then influence intentions and behavior (Fishbein & Aj-

zen, 1975; Fulton et al., 1996; Vaske & Donnelly, 1999).

Research has demonstrated the extent to which an individual's value orientations and awareness of impacts or consequences of behavior can also influence his or her attitudes and behavior (e.g., Fulton et al., 1996; Vaske & Donnelly, 1999). In addition, research has shown that past experiences influence behavioral choices (e.g., McFarlane, Boxall, & Watson, 1998; Schreyer et al., 1984). Little empirical research, however, has examined the extent to which: (a) past experiences influence value orientations, and (b) value orientations influence awareness of consequences of specific behaviors (Joireman, Lasane, Bennett, Richards, & Solaimani, 2001). This article helps to address this knowledge gap by focusing on Oregon's shore-based whale watchers and examining their past experiences in relation to whales and the marine environment (e.g., visit aquarium, ocean), environmental value orientations (e.g., biocentric, anthropocentric), and awareness of impacts associated with personal actions on whales and marine ecosystems.

This type of information can provide commercial tour operators and public land management agencies, such as Oregon Parks and Recreation Department, with an understanding of their audiences' backgrounds and how these factors may influence tourist experiences and behavior (Christensen et al., 2007). Such information can also assist companies and agencies to tailor marine education and outreach programs to particular audiences, and target specific ways of presenting information to encourage environmentally responsible behavior (Manfredo, 2002).

Conceptual Foundation

Awareness of Consequences

A goal of many whale-watching tours and marine programs is to educate participants about wildlife, as well as encourage environmentally responsible behavior (Finkler & Higham, 2004). Social psychologists have suggested that it is possible to predict how an individual is likely to behave in a given situation by whether he or she is aware of consequences of engaging or not engaging in the behavior (Eagly & Chaiken, 1993). Schwartz's

(1977) norm activation model indicates that intentions and behaviors are partially influenced by whether individuals are aware of possible consequences of their behavior on other people, animals, places, or things. If an individual is aware of how his or her actions may affect others, then norms of how he or she should or should not behave are activated and feelings of moral obligation are induced (Kaiser & Shimoda, 1999). For example, if a person is aware that feeding wildlife negatively impacts animal health and causes wildlife to become dependent on and habituated to humans, he or she may be less likely to engage in such behavior (Orams, 2002).

Several studies have empirically examined the effect of awareness of consequences on behaviors in relation to natural resource issues such as recycling (Bratt, 1999; Hopper & Nielsen, 1991), littering (Heberlein, 1972), burning yard waste (Van Liere & Dunlap, 1978), and ocean dumping (Cottrell & Graefe, 1997). Only a few studies, however, have focused on factors that may influence the extent to which an individual is aware of consequences of his or her actions (e.g., Garling, Fujii, Garling, & Jakobsen, 2001; Joireman et al., 2001; Stern, Dietz, Abel, Guagnano, & Kalof, 1999). Stern et al. (1999) showed that beliefs about the environment predicted awareness of consequences of engaging in environmentally responsible behavior. If a person believes that the environment is important and should have equal rights as humans (e.g., Fulton et al., 1996), it is possible that this individual may be more conscious of potential effects of his or her behavior (e.g., recycling) on the environment.

Value Orientations

One possible determinant of an individual's awareness of consequences may be his or her value orientations. A value is an "enduring belief that a specific mode of conduct or end-state of existence is personally or socially preferable to an opposite or converse mode of conduct or end-state of existence" (Rokeach, 1973, p. 5). Values are basic modes of thinking that: (a) are shaped by family, peers, institutions, and experiences; (b) are few in number, relatively stable, and change slowly; (c) reflect enduring characteristics of peo-

ple; and (d) guide life decisions and transcend situations (Manfredo, Teel, & Bright, 2004). Rokeach (1973) listed 36 human values (e.g., polite, capable, security, honesty). Values are part of a person's fundamental cognitive state and influence higher order cognitions such as beliefs, attitudes, norms, intentions, and behaviors (Bem, 1970; Fulton et al., 1996; Stern et al., 1999). Values are mentally and socially constructed ways that individuals use to evaluate situations and the environment around them, and also serve as measures of the desirability of particular codes of conduct (Fulton et al., 1996; Manfredo et al., 2004; Rokeach, 1973).

An individual's values tend to represent those of large groups within societies and they are usually difficult to change, shared widely among people, and difficult to measure in specific situations (Fulton et al., 1996; Garfinkel, 2007; Rokeach, 1973; Schwartz, 1992). Recent research, therefore, has examined beliefs that strengthen and give meaning to fundamental values (e.g., Manfredo, Teel, & Bright, 2003; Vaske & Donnelly, 1999). Beliefs are cognitions, expectations, or knowledge about what is true or factual (Eagly & Chaiken, 1993). They can be either subjective (i.e., what people think is true) or objective (i.e., actuality, facts). These beliefs can be measured with responses to statements such as "humans should manage animals so that humans benefit" and "animals should have similar rights to humans" (Fulton et al., 1996).

Value orientations "are defined by the pattern of direction and intensity among a set of beliefs" (Fulton et al., 1996, p. 28). Patterns of beliefs about an environmental or biophysical issue can be used to arrange individuals along a continuum from anthropocentric (i.e., human centered, utilitarian view of the world) to biocentric (i.e., nature centered view) value orientations (Vaske & Donnelly, 1999). These value orientations can then be used to identify and segment groups who have divergent preferences for information and management. In addition, they can help anticipate receptivity to and polarization over prevention and mitigation strategies, as well as environmentally responsible behavior (Manfredo et al., 2003, 2004).

Value orientations conceptually differ from at-

titudes in at least three ways. First, attitudes are positive or negative affective or emotional evaluations (e.g., favorable, unfavorable; good, bad), whereas value orientations are derived from patterns of cognitive beliefs or thoughts (Fishbein & Ajzen, 1975; Fulton et al., 1996). Second, an individual may hold thousands of attitudes, whereas value orientations are limited in number (e.g., biocentric–anthropocentric, protection–use) (Vaske & Needham, 2007). Third, attitudes have a more focused object than value orientations (Vaske & Donnelly, 1999). If the object, for example, is "overall feeling toward whales," the evaluation is a general attitude. If the object is "watching gray whales along the Oregon coast in 2005," the evaluation reflects a narrower context and timeframe, and thus represents a more specific attitude. By comparison, the object of a value orientation is more general (e.g., the environment, all wildlife). Studies have examined whale watchers' attitudes toward specific objects such as disturbance of whales by boat noise and proximity, amount of educational information provided on whale watching tours, and crowding of boats and whale watchers (e.g., Andersen & Miller, 2006; Finkler & Higham, 2004; Freeman & Kellert, 1994; Manfredo, 2002; Muloin, 1998, 2000; Orams, 2000). Less research, however, has examined whale watchers' broad value orientations toward the environment (e.g., Christensen et al., 2007).

Studies have examined relationships among broad value orientations and more specific attitudes, norms, and behaviors in relation to natural resource issues such as wildlife viewing and management, wildland preservation, and forest management (e.g., Bright, Manfredo, & Fulton, 2000; Daigle, Hrubes, & Ajzen, 2002; Fulton et al., 1996, Manfredo et al., 2003, 2004; Purdy & Decker, 1989; Vaske & Donnelly, 1999; Vaske & Needham, 2007). Little empirical research, however, has focused on relationships between value orientations and awareness of consequences (Christensen et al., 2007; Stern et al., 1999). This article, therefore, examines environmental value orientations of Oregon's shore-based whale watchers and the extent to which they influence awareness of consequences of personal actions toward the marine environment in general and whales in particular.

Past Experience

It is possible that environmental beliefs and value orientations may be shaped by past experiences such as participation in environmental education and learning opportunities (e.g., visit aquariums, read articles about environmental issues). Past experience describes the amount and/or type of experiences that an individual has had in reference to a particular resource or activity (Hammitt et al., 2004; Manning, 1999; Schreyer et al., 1984). Although studies have applied different variables to measure this concept (Hammitt, Knauf, & Noe, 1989; Hammitt et al., 2004; Schreyer & Lime, 1984; Schreyer et al., 1984), it is typically calculated by the total number of years or times that an individual has participated in an activity or visited a given resource (e.g., Hammit et al., 2004; Needham, Vaske, Donnelly, & Manfredi, 2007). Although it is possible to measure a multitude of experiences for a specific activity or resource, Schreyer et al. (1984) noted that it is important that the combination of experiences provides a means for measuring differences among visitors that are useful for the particular study. In this article, therefore, past experience is conceptualized as the number of times per year that whale watchers had experiences associated with whales, the marine environment, and related educational events (e.g., visits to aquariums or the ocean, watch marine education television shows, volunteer for environmental causes).

Past experience is an indicator of the amount and type of information that an individual has available in a given situation (Schreyer et al., 1984). This information, in turn, influences how people understand and interpret current situations (Hammitt & McDonald, 1983; Schreyer et al., 1984). Researchers have mainly examined the influence of past experience on place attachment, motivations for participation, perceptions of crowding and conflict, coping responses, behavior (e.g., site or activity choice), and acceptance of management actions (Hammitt et al., 2004; Manning, 1999). Little research, however, has focused on possible relationships between an individual's past experiences and his or her value orientations. This article examines the extent to which past experi-

ence in events associated with whales and the marine environment may influence whale watchers' environmental value orientations.

Objectives and Hypotheses

One objective of this article, therefore, is to measure Oregon's shore-based whale watchers' value orientations, past experience, and awareness of consequences of their behavior on whales and the marine environment. A second objective is to examine relationships among these three concepts. Based on the literature, two hypotheses are proposed (Fig. 1):

- H₁:** There will be a positive relationship between environmental value orientations and past experience in relation to whales and the marine environment. Whale watchers with substantial experience will be more likely to have stronger biocentric value orientations.
- H₂:** There will be a positive relationship between environmental value orientations and awareness of consequences of personal actions. Whale watchers with stronger biocentric value orientations will be more likely to be aware of effects of their behavior on the marine environment in general and whales in particular.

This article also examines the extent to which value orientations mediate any effect of past experience on awareness of consequences. In addition, it investigates whether participation in Oregon's "Whale Watching Spoken Here" program moderates (i.e., interaction effect) any relationships among the three concepts. In other words, this article determines if any relationships between past experience and value orientations (H₁), and between value orientations and awareness of consequences (H₂) differ depending on whether whale watchers did or did not participate in this program.

Methods

Data Collection

Data were obtained from short two-page surveys administered on-site to shore-based whale watchers in Oregon (USA) during the last week of March 2005 and last week of December 2005 as



Figure 1. Hypothesized model for whale watchers' past experience, value orientations, and awareness of consequences of actions on whales and marine areas. The "+" symbols refer to positive relationships between past experience and value orientations (H_1), and between value orientations and awareness of consequences (H_2).

part of a larger study conducted at seven sites along Oregon's Pacific Coast between Cape Perpetua Scenic Area and Boiler Bay State Park (Fig. 2). These sites were: Boiler Bay State Park, Depoe Bay Whale Watching Center, Devil's Punch Bowl State Park, Yaquina Head Lighthouse, Hatfield Marine Science Center, Cape Perpetua Overlook, and Cape Perpetua Interpretive Center (i.e., Devil's Churn State Park). Taken together, these seven sites were generally representative of most of the 28 "Whale Watching Spoken Here" program sites because they included relatively low, moderate, and high visitation sites, as well as represented a broad spectrum of jurisdictions including a federal Bureau of Land Management outstanding natural area, a scenic area, two interpretive centers, and several state parks. All sites were on the coast and high above the ocean to make it easier for participants to spot whales. Between 10:00 a.m. and 1:00 p.m., there were docents at each site with a sign indicating that they belonged to the "Whale Watching Spoken Here" marine education and outreach program.

Across the seven sites and two data collection periods, 229 visitors completed the survey on-site (response rate = 75%). Funding limited the ability to obtain data for additional time periods, and ancillary analyses showed no substantial differences among survey responses between the two data collection periods of March 2005 ($n = 92$) and December 2005 ($n = 137$). In total, 66% of respondents completed the survey after participating in the "Whale Watching Spoken Here" program by speaking with docents at one or more sites on the same day; 34% of respondents had not participated in this program before completing the survey.

Variables Used in Analyses

As with previous research (e.g., Fulton et al., 1996; Muloin, 1998, 2000; Vaske & Donnelly, 1999; Vaske & Needham, 2007), respondents were asked the extent to which they disagreed or agreed with six belief statements related to environmental value orientations (e.g., "the marine environment requires our protection," "it is important to protect whales") and two statements measuring awareness of consequences related to whales and the marine environment (e.g., "my daily actions affect whales") (Table 1). Responses were measured on 5-point scales of 1 "strongly disagree" to 5 "strongly agree." Past experience was measured using eight different variables asking respondents how many times they had participated in activities associated with whales or marine areas in the past year (e.g., visited the ocean and / or an aquarium, watched television shows about the marine environment). Responses were coded on 5-point scales of 0 "no times" to 4 "10 or more times" (Table 1).

Data Analyses

Internal consistency of multiple-item indices measuring these three concepts (i.e., past experience, value orientations, awareness of consequences) was examined with Cronbach alpha reliability coefficients. Confirmatory factor analysis was used to examine whether variables measuring these three latent factors or concepts provided a good fit and demonstrated construct validity. Structural equation modeling was then applied to: (a) test the hypotheses, (b) examine predictive validity of the three-factor model, (c) assess whether value orientations mediate any relationships be-

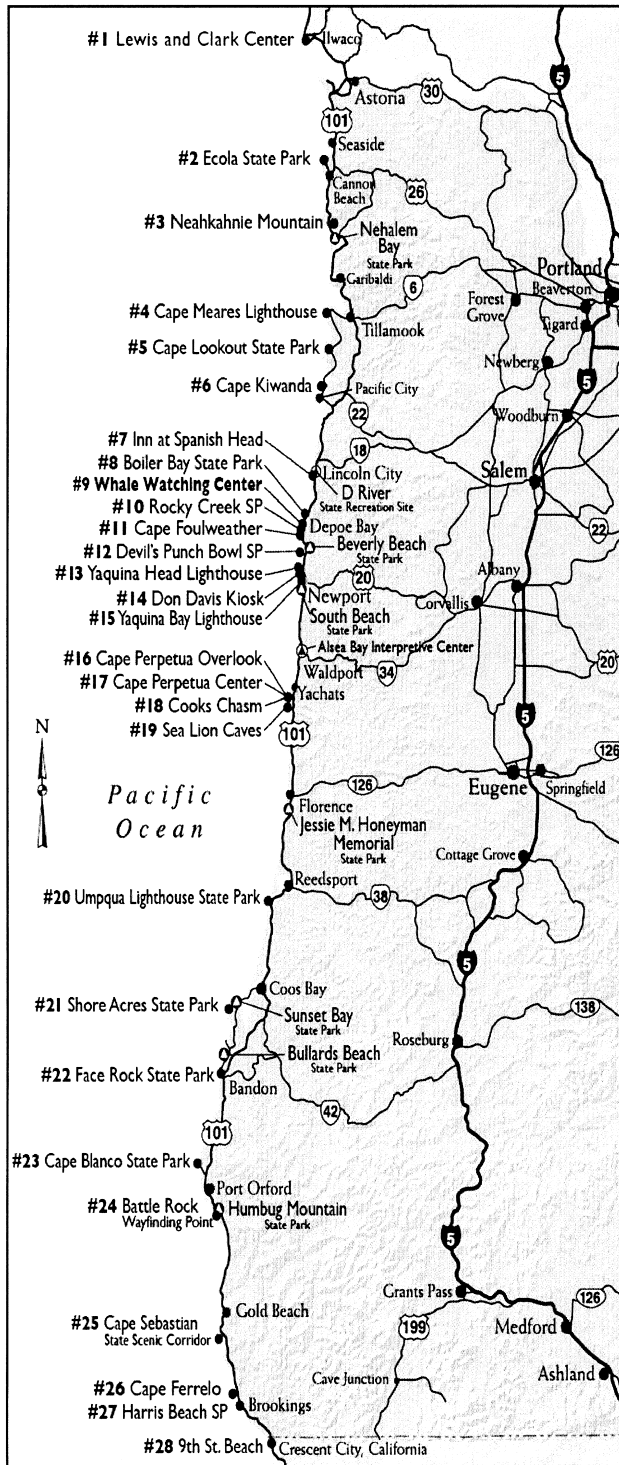


Figure 2. Map of “Whale Watching Spoken Here” sites in Oregon.

Table 1
Reliability Analyses of Variables Measuring Past Experience, Value Orientations, and Awareness of Consequences

| | Item Code | Mean | SD | Item Total Correlation ^a | Alpha if Item Deleted ^b | Cronbach Alpha ^c |
|--|-----------------|------|------|-------------------------------------|------------------------------------|-----------------------------|
| Past experience ^d | | | | | | 0.79 |
| Visited a zoo or aquarium | V ₁ | 0.97 | 0.84 | 0.36 | 0.79 | |
| Visited a state park | V ₂ | 1.97 | 1.19 | 0.49 | 0.77 | |
| Visited the ocean | V ₃ | 2.19 | 1.23 | 0.47 | 0.77 | |
| Read book or magazine about the marine environment | V ₄ | 1.00 | 1.32 | 0.50 | 0.77 | |
| Volunteered to help the environment | V ₅ | 0.61 | 1.07 | 0.42 | 0.78 | |
| Talked to others about the marine environment | V ₆ | 1.18 | 1.38 | 0.66 | 0.74 | |
| Watched television show on the marine environment | V ₇ | 2.20 | 1.37 | 0.56 | 0.76 | |
| Made monetary donation to environmental cause | V ₈ | 0.70 | 0.99 | 0.53 | 0.77 | |
| Environmental value orientation belief statements ^e | | | | | | 0.85 |
| The marine environment requires our protection | V ₉ | 4.50 | 0.51 | 0.67 | 0.81 | |
| It is important to protect whales | V ₁₀ | 4.56 | 0.55 | 0.66 | 0.81 | |
| It is important to protect the marine environment | V ₁₁ | 4.56 | 0.51 | 0.69 | 0.81 | |
| Whales are important for Oregon | V ₁₂ | 4.16 | 0.75 | 0.60 | 0.83 | |
| Whales need a healthy marine environment to survive | V ₁₃ | 4.60 | 0.58 | 0.58 | 0.83 | |
| It is important to spend money to protect whales | V ₁₄ | 4.12 | 0.71 | 0.63 | 0.82 | |
| Awareness of consequences of actions on environment ^e | | | | | | 0.82 |
| My daily actions affect whales | V ₁₅ | 3.70 | 0.86 | 0.69 | — | |
| My daily actions affect the marine environment | V ₁₆ | 4.00 | 0.83 | 0.69 | — | |

^aPearson correlation coefficient between score on individual variable and sum of scores on remaining variables.

^bCronbach alpha when variable removed from scale.

^cReliability coefficient for how well a set of variables measures a single unidimensional latent construct.

^dVariables coded on 5-point scale: 0 "no times," 1 "1 time," 2 "2 to 4 times," 3 "5 to 9 times," 4 "10 or more times."

^eVariables coded on 5-point scales from 1 "strongly disagree" to 5 "strongly agree."

tween experience and awareness of consequences, and (d) ascertain whether participation in the "Whale Watching Spoken Here" program moderates any relationships (i.e., interaction) among these three latent factors (Fig. 1).

A variable may function as a mediator to the extent that it accounts for the relationship between the predictor (i.e., past experience) and criterion (i.e., awareness of consequences) (Baron & Kenny, 1986). Three separate models are required to demonstrate mediation (Hayduk, 1987). In a full mediation model, the predictor only influences the criterion indirectly through its effect on the mediator (i.e., value orientations). In a partial mediation model, the predictor influences the criterion directly and indirectly through its effect on the mediator. In a direct effects model, the predictor directly influences both the criterion and mediator, but the mediator does not affect the criterion (Baron & Kenny, 1986; Vaske & Donnelly, 1999).

Several conditions must be met for full mediation to occur. First, the predictor must be significantly related to the mediator, and the predictor

must significantly affect the criterion (i.e., direct effects model). Second, paths between the predictor and mediator and between the mediator and criterion must be significant in both the full and partial mediation models. Full mediation is evident when the direct path from the predictor to the criterion is not significant in the partial mediation model. Third, a comparison of the models using the change in chi-square statistic ($\Delta\chi^2$) indicates that the full mediation model is better than the direct effects model, and the partial mediation model is no better than the full mediation model (Baron & Kenny, 1986).

Multigroup structural equation models were also conducted to determine if relationships between past experience and value orientations and between value orientations and awareness of consequences differed depending on whether respondents did or did not participate in the "Whale Watching Spoken Here" program (i.e., moderation or interaction effect). One model examined factor loadings and path coefficients among these three concepts for nonparticipants, and a second model

for participants. The first step in moderation analysis involves testing for measurement invariance to reveal any differences in factor loadings between the two groups (i.e., participants, nonparticipants). The second step is to run the structural model after imposing constraints so that the path coefficients among the concepts are constrained to equality across groups. The final step involves running the model without constraints, testing for differences in effects between groups, and comparing models (no constraints, constraints) using the change in chi-square statistic ($\Delta\chi^2$). An insignificant test suggests that moderation is not present (i.e., no interactions across groups) (Baron & Kenny, 1986; Byrne, 1994; Chou & Bentler, 1995).

EQS 6.1 software and Satorra-Bentler robust estimation to correct for multivariate nonnormality were used because data skewness and kurtosis indicated violations of the normal distribution assumption (Byrne, 1994; Chou & Bentler, 1995). Robust corrected comparative fit index (CFI*), non-normed fit index (NNFI*), and root mean square error of approximation (RMSEA*) assessed model fit (* denotes robust corrected estimation and indices). CFI* and NNFI* values ≥ 0.90 and RMSEA* values ≤ 0.08 suggest acceptable fit (Browne & Cudeck, 1993). Robust standard errors were used for test statistics.

Results

Descriptive Findings

Mean ratings for the frequency that whale watchers participated in any activity in relation to whales and the marine environment ranged from 0.61 (0 to 1 time per year) to 2.20 (2 to 4 times per year) among the eight past experience events (Table 1). Respondents, on average, visited the ocean and watched television programs about marine areas the most, whereas they were least likely to have volunteered to help the environment or made monetary donations to any environmental cause. Respondents moderately to strongly agreed that whales are important for Oregon, it is important to protect whales and marine areas, whales need a healthy environment to survive, and it is important to spend money to protect whales. Whale watchers moderately agreed that their own

actions impact whales and the marine environment.

Measurement Models

Confirmatory factor analysis demonstrated that the data provided an acceptable fit for the three latent concepts (i.e., past experience, value orientations, awareness of consequences). Figure 3 shows the standardized factor loadings associated with each multi-item concept. All factor loadings were acceptable (i.e., ≥ 0.40) and ranged from 0.40 to 0.76 for variables measuring past experience, 0.61 to 0.79 for beliefs associated with environmental value orientations, and 0.76 to 0.89 for variables measuring awareness of consequences. All loadings were significant at $p < 0.05$. Fit indices indicated strong construct validity and measurement model fit (S-B $\chi^2 = 150.68$, $p < 0.001$, CFI* = 0.95, NNFI* = 0.94, RMSEA* = 0.05).

Reliability coefficients indicated high internal consistency for each concept: 0.79 for past experience, 0.85 for beliefs associated with value orientations, and 0.82 for awareness of consequences (Table 1). A Cronbach alpha coefficient ≥ 0.65 indicates that items are measuring the same concept and justifies combining items into a single index (Cortina, 1993; Nunnally & Bernstein, 1994). Deletion of any variable from its respective concept did not improve reliability.

Structural Models

As predicted by hypothesis 1, a significant positive relationship was observed between value orientations and past experience in relation to whales and the marine environment. Whale watchers with substantial experience were more likely to have stronger biocentric value orientations. The standardized coefficient of $\beta = 0.47$ was significant at $p < 0.05$ (Fig. 3). Past experience explained 22% of the variance in environmental value orientations.

Hypothesis 2 predicted a positive relationship between value orientations and awareness of consequences of personal actions. The standardized coefficient of $\beta = 0.49$ was significant at $p < 0.05$ (Fig. 3). Environmental value orientations explained 24% of the variance in awareness of consequences. This finding supports hypothesis 2; whale watchers with stronger biocentric orienta-

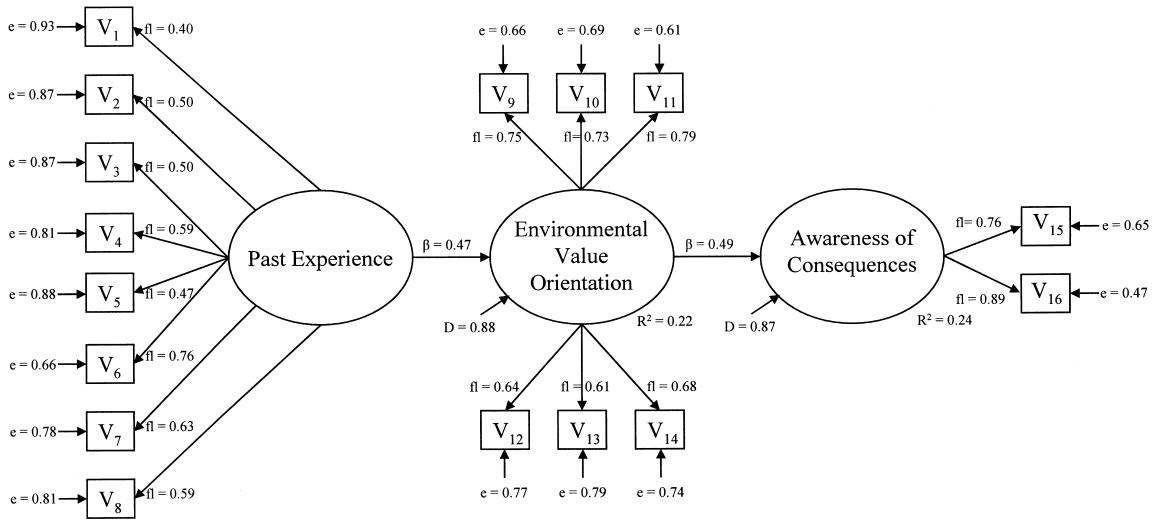


Figure 3. Structural model of relationships among past experience, environmental value orientation, and awareness of consequences. β represents path coefficients, R^2 represents variance explained, fl represents factor loadings, e represents errors, and D represents disturbances. All factor loadings and path coefficients were significant at $p < 0.05$. Based on Satorra-Bentler robust estimation for multivariate nonnormality, final model fit indices: S-B $\chi^2 = 152.63$, $p < 0.001$, NNFI* = 0.94, CFI* = 0.95, RMSEA* = 0.05. See Table 1 for variables corresponding to codes (e.g., V₁).

tions were more likely to be aware of effects of their behavior on whales and their habitat.

The next step in the analysis was to examine whether value orientations mediate the relationship between experience and awareness of consequences. In the direct effects model, past experience had a significant positive effect on awareness of consequences ($\beta = 0.34$, $p < 0.05$). In the partial mediation model, the path coefficient between past experience and environmental value orientation was positive and significant ($\beta = 0.47$, $p < 0.05$), and the path between value orientation and awareness of consequences was also positive and significant ($\beta = 0.49$, $p < 0.05$). The direct path coefficient between experience and awareness of consequences, however, was not statistically significant ($\beta = 0.13$, $p > 0.05$). These findings support the full mediation model.

Further support for the full mediation model was evident from the change in chi-square statistics (i.e., chi-square difference tests). The full mediation model had a significantly better fit than the direct effects model ($\Delta\chi^2 = 102.16$, $p < 0.001$), but was statistically equivalent to the partial mediation model ($\Delta\chi^2 = 1.95$, $p = 0.163$). Structural model fit for the full mediation model among the three la-

tent factors was acceptable and strong (S-B $\chi^2 = 152.63$, $p < 0.001$, CFI* = 0.95, NNFI* = 0.94, RMSEA* = 0.05).

The final step in the analysis was to conduct multigroup structural equation models to determine if relationships between past experience and value orientations and between value orientations and awareness of consequences differed depending on whether respondents did or did not participate in the "Whale Watching Spoken Here" program on the day that they were surveyed (i.e., moderation or interaction effect). All tests for invariance of factor loadings and structural model paths were not statistically significant. The chi-square difference test indicated that the structural paths did not significantly differ ($\Delta\chi^2 = 1.31$, $p = 0.520$) between participants (experience \rightarrow value orientations $\beta = 0.45$; value orientations \rightarrow awareness of consequences $\beta = 0.52$) and nonparticipants (experience \rightarrow value orientations $\beta = 0.54$; value orientations \rightarrow awareness of consequences $\beta = 0.37$). Moderation was not present because relationships among past experience, value orientations, and awareness of consequences did not differ depending on whether whale watchers did or did not participate in this program.

The full mediation model, therefore, best described relationships among Oregon's shore-based whale watchers' past experience, environmental value orientations, and awareness of consequences. These relationships were not moderated by whether or not viewers participated in the "Whale Watching Spoken Here" program.

Discussion

This article focused on Oregon's shore-based whale watchers and examined their past experience in relation to whale watching and marine settings (e.g., visits to aquariums, the ocean), environmental value orientations (e.g., biocentric, anthropocentric), and awareness of impacts associated with personal actions on whales and the marine environment. Based on their responses to the survey variables, whale watchers, on average, believed that whales and marine areas are important and require protection, and their daily actions affect this marine species and its habitat. Respondents were most likely to have visited the ocean and watched television programs about whales and/or marine areas; they were least likely to have volunteered or made monetary donations to any environmental cause.

Based on their responses to the survey variables, whale watchers' past experiences with whales and the marine environment positively influenced their environmental value orientations. These value orientations, in turn, positively influenced awareness of consequences of personal behavior on whales and marine areas. In other words, viewers with more experience held stronger biocentric value orientations and were more aware of impacts their actions can have on these animals and the environment. Value orientations also fully mediated effects of experience on awareness of consequences, suggesting that experience was indirectly related to awareness of consequences through the effect of value orientations. Relationships among value orientations, experience, and awareness of consequences did not differ between whale watchers who did and did not participate in Oregon's "Whale Watching Spoken Here" program on the day that they were surveyed. These findings have implications for theory, management, and future research.

From a theoretical perspective, previous research has largely focused individually on the concepts of past experience, value orientations, and awareness of consequences (Manfredo et al., 2004; Manning, 1999; Vaske & Whittaker, 2004). A few studies have addressed relationships among some of these concepts (e.g., Bratt, 1999; Stern et al., 1999), but little research has examined relationships among all three concepts taken together, especially within the context of marine education and outreach in general and whale watching in particular (Christensen et al., 2007). This study aimed to address this knowledge gap. Results showed that past experience influenced value orientations, which subsequently influenced awareness of consequences. When measuring beliefs and examining possible correlates and determinants of value orientations, researchers should consider tourists' past experiences associated with the activity, resource, or issue. Likewise, researchers should consider the role of value orientations in influencing tourists' awareness of impacts of a particular behavior, and the mediating relationship between past experience and awareness of consequences.

Given their high factor loadings and reliabilities, variables used in this study appear to represent an acceptable approach for measuring past experience in relation to marine and environmental issues, awareness of impacts on whales and the marine environment, and environmental value orientations. One possible limitation of this study, however, was the lack of a comprehensive measure of awareness of consequences (i.e., two variables: "my daily actions affect whales," "my daily actions affect the marine environment") (Bratt, 1999; Joireman et al., 2001). Research on the human dimensions of whale watching, therefore, should continue examining reliability and construct validity of additional variables and dimensions of these three concepts, and the extent to which results may be similar or different to those observed in this article.

Findings showed that 22% of the variance in environmental value orientations was explained by past experience, and 24% of the variance in awareness of consequences was explained by value orientations. This suggests, however, that a reasonably large proportion of value orientations and

awareness of consequences remained unexplained by the model presented in this article. Empirical research is needed to examine other possible correlates and determinants (e.g., sociodemographic characteristics, self-efficacy, norms, attitudes) of these three concepts in the context of whales, whale watching, and the marine environment.

From an applied perspective, findings showed that an individual's past experiences with educational programs and participation in marine and environmental activities have a direct effect on his or her value orientations and an indirect (i.e., mediated) effect on awareness of consequences of personal behavior. Research suggests that value orientations and awareness of consequences can influence other cognitions such as attitudes, intentions, and behaviors (e.g., Eagly & Chaiken, 1993; Fulton et al., 1996; Schwartz, 1977; Vaske & Donnelly, 1999; Vaske & Whittaker, 2004). For programs such as "Whale Watching Spoken Here" that seek to influence individuals' environmental attitudes and behaviors, it is important to know if these programs influence their audiences and if so, what types of cognitions are impacted by the programs. Understanding this information can assist education and outreach programs in determining how much and what types of interpretation to provide, and how to tailor this information to tourists.

To illustrate, many shore-based whale watchers in this study had relatively biocentric beliefs about marine issues and the environment, and were somewhat likely to be aware of consequences of their own actions on marine species and their habitat. One goal of the "Whale Watching Spoken Here" program involves explaining to visitors how they can help protect whales by recycling, reducing pollution, and understanding reasons why whales and marine areas are threatened by humans. To achieve this goal, results suggest that it may be useful to increase and improve information and education opportunities that are provided to visitors (e.g., more docents, innovative media such as audio guides and podcasts, interactive interpretive displays), with the expectation that they may influence value orientations and increase awareness about consequences of actions on whales and marine ecosystems. As a result, individuals may be more likely to engage in more responsible environmental behavior (Manfredo, 2002).

The need for understanding how these types of marine education and outreach programs influence the public is increasing, as attention on the condition of the ocean is becoming more prevalent (PEW Oceans Commission, 2003; US Commission on Ocean Policy, 2004). According to the PEW Oceans Commission (2003), there is a "need to provide the public with understandable information about the structure and functioning of coastal and marine ecosystems, how ecosystems affect daily lives, and how we affect ecosystems" (p. 11). Andersen and Miller (2006) found that a large percentage of whale watchers look forward to informational and educational aspects of whale watching trips, and viewer satisfaction increases when they learn about whales and the marine environment. Results from this article take Andersen and Miller's (2006) findings one step further and suggest that experiences involving learning about marine ecosystems can influence beliefs and awareness of impacts, which, in turn, may promote more responsible environmental behavior. In other words, experiences such as visiting aquariums or participating in programs such as "Whale Watching Spoken Here" influence environmental value orientations, promote awareness and responsibility of human impacts on whales and the marine environment, and may help reduce impacts on species and ecosystems by encouraging responsible environmental behavior (Manfredo, 2002).

This study should be viewed as one initial approach for understanding whale watchers' past experiences, environmental value orientations, and awareness of consequences of actions in relation to whales and marine ecosystems. Results are limited to shore-based whale watchers in Oregon and may not generalize to whale watchers in other locations or viewers of other wildlife species. Researchers are encouraged to implement various theoretical and methodological approaches to improve understanding of the human dimensions of whale watching.

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