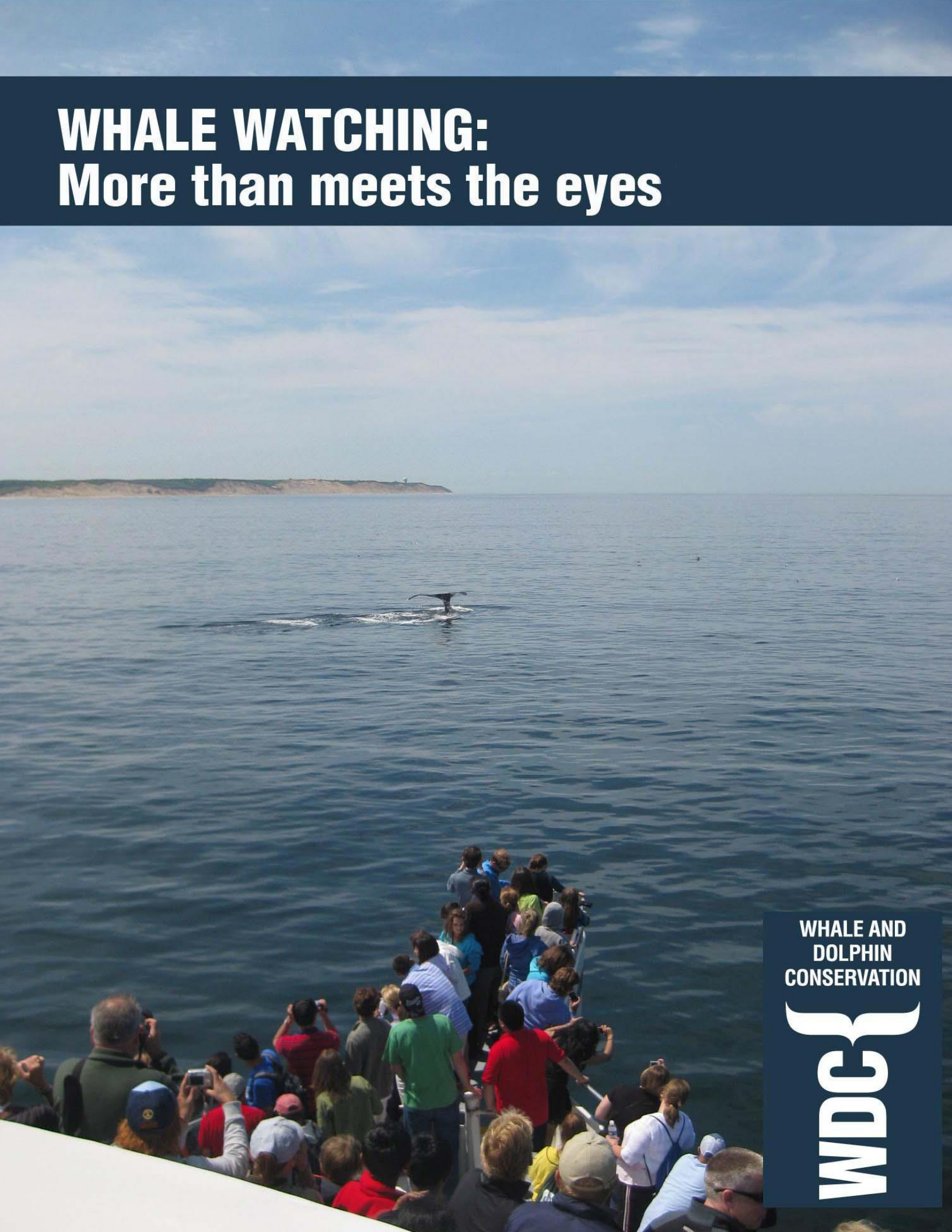
WHALE WATCHING:
More than meets the eyes



WHALE AND DOLPHIN CONSERVATION

WDC

Whale Watching: More Than Meets The Eyes.
A special report from WDC

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ABSTRACT:
This study explores a possible causal relationship between whale watch experience, a whale watcher's awareness of problems and their consequences in order to foster support for marine conservation. If effective, whale watching can stimulate individuals to feel concern for marine mammals, responsibility for the marine environment and commitment to activities that support marine conservation. However, survey data have shown that participants on whale watch tours in New England showed decreased concern after the completion of the trip. It is, therefore, recommended that, besides creating concern for marine mammals and promoting initiatives to support marine conservation, a whale watch tour should also make marine conservation issues personally relevant. Communicating through the general public's egoistic value orientation, by addressing negative consequences for human beings resulting from adverse consequences on the marine environment, can result in pro-environmental behavior that supports marine conservation.

KEYWORDS: Whale watching, marine mammal, effectiveness, value orientations, awareness of consequences, marine conservation

PREFACE AND ACKNOWLEDGEMENTS

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1 INTRODUCTION

1.1 Background

In the last few decades, marine mammal based tourism has experienced rapid growth in popularity (Hoyt, 2001; Muloin, 1998; O'Connor et al., 2009). Watching whales in particular has enjoyed phenomenal growth and is one of the fastest growing tourism products in the world (Hoyt, 2000). Although the generic term 'whale' watching is used, it is important to note that the term also encompasses watching other cetacean species, such as dolphins and porpoises. Whale watching has been defined by one of the world's foremost experts in this field, Erich Hoyt (1995, p. 3) as "tours by boat, air or from land, formal or informal, with at least some commercial aspect, to see and/or listen to any of the some 80 species of whales, dolphins and porpoises." Between 1991 and 2001, the number of whale watchers increased internationally by an average of 12.1% per year (Hoyt, 2001). This means that whale watching grew at a faster rate than general world tourism (Hoyt, 2001). At that time, the industry was estimated to: generate over $1 billion USD in total expenditure each year; reaching over nine million participants per annum; and take place in over 495 communities in 87 countries and overseas territories which span every continent of the globe (O'Connor et al., 2009). Since then, the industry has continued to show a very strong growth. With an average growth rate of 3.7% per year, it compares well against a global tourism growth of 4.2% per year over the same period (O'Connor et al., 2009). Whale watching continues to develop in those countries with long established whale watch industries. Commercial whale watching now takes place in over 119 countries and territories, with over 13 million participants worldwide (O'Connor et al., 2009). These data include 3,300 whale watch operators on a global level with a total generated expenditure of $2.1 billion USD (O'Connor et al., 2009). While the economic benefits of commercial whale watching have been demonstrated, an increase in whale watching has resulted in scientific concern about resulting short and long term impacts to whales and the sustainable management of the marine environment. However, comparatively little research has focused on the human dimensions of whale watching (Christensen, 2007; Duffus & Dearden, 1993; Finkler & Higham, 2004; Malcolm et al., 2002; Orams, 2000; Parsons, Lück, & Lewandowski, 2006; Zeppel & Muloin, 2008), with limited assessment on the potential short or long term conservation benefits that may result from whale watching. This study provides further insight into the impact that a responsible whale watch experience has in relation to whale watcher's cognitive constructs.

1.1.1 Critical issues

One is likely to assume that this continuing worldwide growth in whale watching will put more pressure on existing wildlife watching sites, cetacean populations and habitats, and will spur the development of wildlife watching activities in new areas and for new species (Tapper, 2006). Orams (1999, as cited in Orams, 2000) argues that the use of whales as a tourist attraction can be seen as a form of harmful exploitation. This represents the classic "tragedy of the commons" problem (Harding, 1968) in which vulnerable cetaceans are repeatedly targeted as common-pool resources by the whale watching industry, often including close encounters. This assumes

tourists who are on the boat closest to the whales gain the most benefit from the close presence of whales, leading to an increase in the number of boats and competition among boats to have close encounters. If true, this can result in the deterioration of both the quality of the whale-watching experience and the quality of life for the whales caused by humans disturbing their natural habitat. Viewing whales in their natural environment, if not conducted responsibly, may disturb whales' natural behavior such as feeding, nursing, resting and migration patterns, causing harassment (Spradlin et al., 2001) and resulting in potential long-term avoidance of important areas (Lusseau & Bejder, 2007).

Given the fact that many of the great whales are endangered while other species are classified as vulnerable and are now travelling down that same path due to human impacts (Read et al., 2006; Turvey et al., 2007), there is a much needed point for protecting the whales on the political agenda. While at the same time, whale watching is promoted as a sustainable and non-lethal alternative to commercial whaling (e.g. O'Connor et al., 2009). It is therefore strongly recommended that the fast growing whale watching industry should maximize benefits that result in the sustainable use of whales while minimizing impacts to the species and habitats. Responsible whale watching is therefore key to ensure the long term sustainable use of whales as a natural resource.

1.1.2 Responsible whale watching

The International Whaling Commission (IWC) is the only global body solely responsible for the management of whales. Along with other international authorities, they have acknowledged commercial and recreational whale watching as a potentially sustainable use of whales and other cetaceans (IFAW, 1997). The IWC has provided a platform for discussion regarding whale watching including the scientific, legal, socio-economic and educational aspects. Several research organizations are conducting scientific research on board whale watch vessels through data collection on e.g. whale identification and whale behavior (Robbins & Frost, 2009). These data have been instrumental in establishing marine protected areas that benefit whales and their environment (NOAA, 1993). These scientific programs of several of these organizations have flourished through multiple collaborations with local whale watch operators. Apart from that, the International Fund for Animal Welfare (IFAW) believes that whale watching helps to foster visitor appreciation of the importance of marine conservation and can be used to drum up public support for the protection of whales (WWF, 2003; Higginbottom, 2004; McIntyre, 2006, as cited in Higham & Lück, 2008; WDCS, n.d.).

This potential outcome lies in line with many advocates and scholars who agree that the whale watching industry has the potential to improve the level of environmental knowledge of whale watch participants and encourage their pro-environmental attitudes (e.g. Zeppel & Muloin, 2008). To realize that, local guides who are trained as naturalists should convey this scientific and local knowledge to whale watchers and motivate them to support marine conservation by means of interpretation, which ultimately should result in a conservation outcome (Tilden, 1957, as cited in Peake et al., 2009).

1.1.3 Whale watching in Northeastern United States

The United States has the largest whale watching industry in the world. The Northeast region of the United States, and New England in particular, is one of the most popular whale watching destinations in the world where whale watching has become a significant aspect of the local tourism economy (Hoyt, 2001; O'Connor et al., 2009). In 2008, about 910,000 tourists took boats to observe whales in New England, with the Stellwagen Bank Marine Sanctuary area accounting for around 80% of whale watching in the region (O'Connor et al., 2009). Nearly 30 whale watching companies currently operate within the region, providing critical economic support to their local communities (O'Connor et al., 2009).

In the United States, marine mammals are protected under the Marine Mammal Protection Act (MMPA) which prohibits "takes" including injury, death, and harassment (i.e. having their important natural behaviors interrupted). In order to protect and conserve marine mammals, and ensure compliance with federal legislation to avoid harassment of marine mammals, voluntary regional whale watching guidelines were implemented by the National Oceanic and Atmospheric Administration (NOAA). Whale watching guidelines reduce the risk of harassment which is prohibited under federal law. For example, it is recommended that vessels do not deliberately approach large whales (other than regulatory measures for North Atlantic right whales) in New England closer than 100 feet (NOAA, 2005). As whale watching and the number of boats viewing whales has increased, promoting stewardship and understanding among the general public of the issues cetaceans and their habitat face is as important as, and complementary to, working with boat operators to encourage responsible behavior around whales. For that reason, a collaborative effort between NOAA Fisheries Service's Northeast Regional Office (NMFS), Stellwagen Bank National Marine Sanctuary (SBNMS), and the Whale and Dolphin Conservation Society (WDCS) resulted in the Whale SENSE program.

1.1.4 Whale SENSE

The Whale SENSE program is a voluntary recognition and education program that is offered to whale watch companies in Northeastern United States (Maine to Virginia) at no charge. It has been developed, with input from Northeast region whale watching companies, to minimize the potential harassment of large whales that may result from commercial viewing activities. Its mission is to promote responsible stewardship of large whales in the Northeast region and recognize commercial whale watching companies that set a positive standard for responsible practices and education. It hopes to encourage the whale watching industry to raise the bar for whale watching education, ease competition to get closest to the whales and increase protection for whales by giving companies a different competitive edge where participating companies can market themselves as the company that cares about the whales, rather than the company that can get the closest to the whales. The acronym SENSE stands for:

Stick to NOAA's Northeast Regional whale watching guidelines;
Educate naturalists, operators, and guests to have SENSE when whale watching;
Notify appropriate networks/agencies of right whales or whale problems;
Set an example to others on the water;
Encourage ocean stewardship.

Whale SENSE is aimed towards both commercial whale watch operators and their customers with the goal to increase their awareness and knowledge about responsible marine mammal viewing practices, whale behavior and biology/ecology, the laws and guidelines protecting whales, and stewardship of the marine environment. In order to sustain and improve the health of the marine environment, creating awareness towards the ocean's vulnerability is very much needed as the Pew Oceans Commission and the U.S. Commission on Ocean Policy have both strongly recommended (Christensen, 2007). The hope and goal of the Whale SENSE program, and whale watching education in general, is to utilize the whale watch experience as a means to inspire a long-term investment in marine conservation from those who participate.

1.2 Internship objective

1.2.1 Problem statement

Seeing as we are now in the third wave of environmental, which spurs global environmental awareness, puts sustainable development up as its core concept and has large segments of society as its social carriers, it is quite important in explaining to the whale watching audience the need to put conservation high up the political agenda. Educating the public about the importance of marine conservation through responsible viewing is a critical component of protecting large whales and the marine environment, and this combination of outreach and educational work underpins all programs of the WDCS.

However, with estimates of around one million visitors whale watching in this relatively small geographic region of Stellwagen Bank on a yearly basis (NOAA, 1994), it is not currently known how effective whale watching is as a learning tool. There is a need to evaluate the effect of whale watch education. Of particular interest is the question of whether education received on a whale watch is retained and changes the behavior of the watchers, making them more sensitive to marine conservation, and whether a program such as the Whale SENSE program, might influence the choosing of a whale watch company. The overall question being asked by this study is to explore the link between whale watch passengers being interested in whales and changing their behaviors to act in the best interest of marine conservation (and therefore the whales)? For that reason, there is a need to evaluate the impact of messaging communicated on a whale watch tour in order to determine which aspect(s) of the educational program are effective/ineffective at fostering pro-conservation attitudes and behavioral changes.

1.2.2 Internship assignment

This project examines the human dimension of whale watching in New England. The assignment is to quantify the educational value of responsible whale watching in that area. More specifically, the assignment is to analyze visitors pre- and post-surveys on whale watch tours to ascertain how the whale watch experience influences passengers' understanding of marine conservation issues and awareness of how personal actions impact the marine environment and marine mammals. Concretely, this means that the student will develop a survey which measures changes towards these and several other concepts to determine the effectiveness of the

educational impact of the whale watch tours. This assignment was developed and given to the student by the WDCS.

1.3 Research Focus

Whale watching exemplifies a potential sustainable use of cetaceans, where benefits that result from whale watching may result from the potential use of this resource by future generations. The focus in this study is to understand to what extent a whale watch tour affects the cognitive constructs that are needed in order to foster pro-environmental behavior. Problem awareness, awareness of consequences and value orientations are said to be factors that can be influenced most easily by environmental educational techniques and used to develop more effective educational messages to influence behavior (Hockett et al., 2004). This might provide a basis to conduct further research into gaining people's support for preserving endangered species.

1.3.1 Research objectives

The Whale SENSE program seeks to facilitate a learning environment and educate whale watchers that the whales they are observing are endangered and/or protected and that guidelines are in place in order to protect whales from potential harmful effects of whale watching. Additionally, the program aims to educate passengers on other major threats induced by humans (e.g. pollution, entanglement and ship strikes). The potential short term outcome should therefore be an increased level of public awareness in marine conservation issues when it comes to protecting whales and the marine environment. In the long run, the Whale SENSE program ought to prompt more environmentally desirable changes in whale watchers' attitudes and behavior towards marine conservation.

The overall objective of this study is therefore to determine the effectiveness of both the Whale SENSE program and whale watching as a platform to enhance people's understanding of and awareness of consequences on their personal impact towards protection of the marine environment. Certainly this level of awareness should not be seen as an end in itself, but an enhanced level of awareness of consequences may manifest itself in one feeling more responsibility towards the marine environment. According to the value-belief-norm (VBN) theory of pro-environmental behavior (Stern, 1999), this enhanced feeling of responsibility may eventually manifest itself in pro-environmental behavior. In the background of this study, this can be translated in action towards supporting marine conservation. The guiding research questions are: To what extent does a whale watch tour increase the awareness of the consequences regarding their impact on the marine environment? Are passengers receptive to educational programs, such as the Whale SENSE program?

The Ocean Foundation (n.d.) states that one of the most significant barriers to progress on one gaining awareness of their own actions in the marine environment is a lack of real understanding among the general public of general ecological concepts and ocean literacy principles. Evidence suggests that it is necessary for people to have this fundamental understanding of the environment in order for them to be aware of how their own actions can hurt the environment or how they can behave more environmentally (Hines et al., 1986; Hwang

et al., 2000, as cited in Christensen, 2007). The general public does not relate health of the oceans to personal actions and does not recognize the inextricable interconnectivity humans have with ocean systems (The Ocean Foundation, n.d.). For example, the general public might not know that fertilizer runoff from farms and lawns is a huge problem for coastal areas or that letting a balloon in the air can be very hazardous for marine wildlife once it lands in the ocean as these animals assume it is something edible and might ingest the plastic. Measuring one's awareness of ocean's vulnerability is therefore another key objective to take into account.

This study also aims to examine environmental value orientations of whale watchers in the New England region and the extent to which these value orientations facilitate awareness of consequences about marine environmental threats posed by personal actions. Additionally, it will be examined if an enhanced level of awareness of consequences induces an ascribed feeling of responsibility and if this can be traced back to someone's wildlife value orientations. Overall, the determined research objectives with corresponding research questions can be found below:

1) To analyze current whale-watch passenger demography.

2) To assess the level of passenger's knowledge of laws and guidelines pertaining to whale watching activities.

- Do whale watchers know that there are guidelines in place to benefit the welfare of marine mammals?
- What aspects of a whale watch tour do whale watchers believe to be important before their tour?

3) To explore if the concept of an education/conservation program impacts peoples decisions on choosing their whale watch tour company.

- What made whale watchers choose their whale watch tour company?
- Are whale watchers aware of the Whale SENSE program?
- Would an educational program like Whale SENSE play a role in the decision-making process when choosing a whale watch tour?

4) To understand whale watchers' attitudes towards marine conservation and values toward the marine environment in recreation and tourism settings.

- How strong are whale watchers' biocentric value orientations towards the marine environment?
- Do people share stronger biocentric values if they have had more experience in whale watching?
- To what extent do people take individual responsibility for the state of the marine environment?

5) To assess the level of public understanding and awareness about different marine conservation issues.

- How do people perceive the current health status of the marine environment?
- How does awareness, and understanding of the vulnerability of the oceans' health differ on the basis of age, gender, and formal levels of education?
- How much understanding and awareness was gained after a whale watch tour?

6) To identify obstacles to behaviors that protect and benefit the marine environment.

- What is the whale watcher's level of understanding of their personal impact on the marine environment and marine mammals?
- How much does understanding about the marine environment determine people's awareness of adverse consequences to the marine environment?
- What are people willing to do to conserve the marine environment?
- Do whale watchers perceive themselves to be aware of how to engage in marine conservation?

1.3.2 Products and deliverables

The data gathered from this report will serve as a baseline for evaluating and improving the conservation benefit of future educational programs on board commercial whale watching vessels by developing a scientific investigation that can be used to: improve educating skills within the commercial whale watching industry; empower the public to engage in marine conservation; and provide the industry incentive to maintain responsible whale watching protocols and a high standard of interpretation.

2 LITERATURE REVIEW AND THEORETICAL FRAMEWORK

This chapter outlines the review of theoretical and empirical literature. A thesis by Christensen (2007) serves, in part, as a foundation of this study. Christensen touched upon this topic while exploring a relationship between shore-based whale watchers' participation in a marine outreach program and three precursors to behavior: visitors' past experiences, value orientations, and their awareness of personal actions surrounding the marine environment in general and whales in particular. This study attempts to create a better understanding of whether a whale watch tour can strengthen awareness of consequences and induce feelings of responsibility while creating an impetus towards support for marine conservation. To gain a deeper insight in this process, two theoretical frameworks are taken into consideration: the cognitive hierarchy model of human behavior and the Value-Belief-Norm (VBN) Theory. Sections 2.1 and 2.2 provide background theory concerning the relevant cognitive constructs and define the concepts in relation to this research. Sections 2.3 will elaborate on the concept of problem awareness. Section 2.4 provides the framework in which the relevant concepts are categorized.

2.1 The Cognitive hierarchy

The cognitive hierarchy of human behavior attempts to explain human behavior by understanding the thought processes. The underlying theory suggests that someone's view of the environment can be organized from generally broad concepts (values, value orientations) to more specific concepts (attitudes, norms, behavioral intentions, and behaviors). The framework of the cognitive hierarchy model builds upon relatively few but stable cognitive processes on the bottom of the framework and more faster-forming cognitive processes subject to change on the top (see Figure 1).

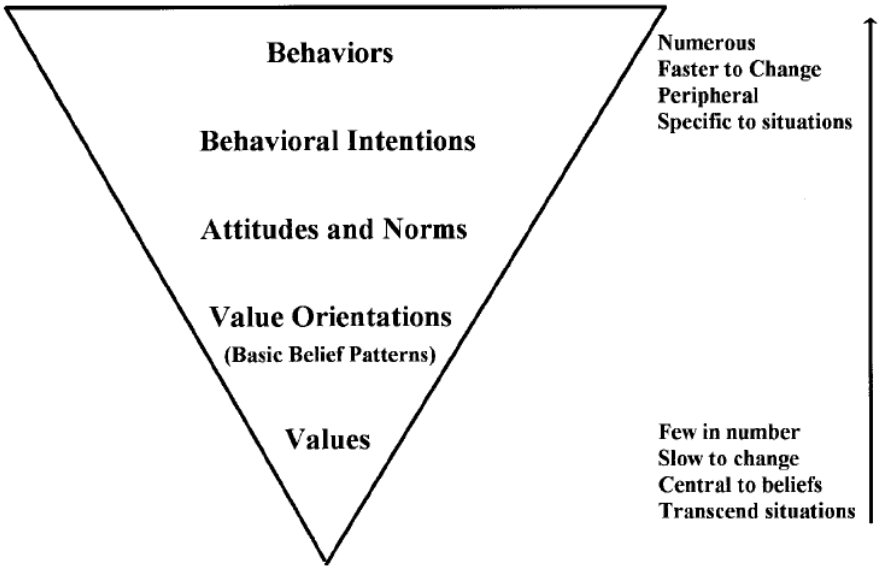

Figure 1: The Cognitive Hierarchy Model of Human Behavior (Vaske & Donnelly, 1999)

The relationship between these several hierarchical levels have been tested and resulting models have been used to make predictions about level of support among the general public for

a variety of natural resource issues (Vaske and Donnelly, 1999). Values, value orientations, norms, attitudes, behavioral intentions, and behaviors have been described as the cognitive constructs in a cognitive hierarchy of human behavior (Fulton, Manfredo, and Lipscomb, 1996). These cognitions are a "collection of mental processes and activities used in perceiving, remembering, thinking, and understanding, as well as the act of using these processes" (Ashcraft, 1994, as cited in Manfredo et al., 1999, p. 500). Values form the foundation of the model. Rokeach (1973, as cited in Manfredo et al., 2009) states that people have a limited amount of values, but those values are central to one's cognitive structure. They represent the most basic beliefs about the world, life goals, and develop early in life, remain stable throughout a person's life and transcend specific situations and objects (Rokeach, 1979, as cited in Manfredo et al., 2009). These basic beliefs can be organized into patterns of directions, called value orientations.

2.1.1 Value orientations

Value orientations give specific meaning to the more global cognitions that are represented in values (Manfredo et al., 1999). Participants in tourism activities have been classified according to their value orientations towards general classes of objects or natural resources, e.g. wildlife (Fulton et al., 1996; Jacobs, 2007; Manfredo et al., 2009), forests (Vaske et al., 2003), and coral reefs (Needham, 2010). In contrast with personal values, which tend to be widely shared by all members of a culture and are therefore unlikely to account for much variability in specific attitudes and behavior, value orientations can predict higher-order cognitions such as attitudes, behavioral intentions and behavior (Fulton et al., 1996; Vaske & Donnelly, 1999). Even though value orientations, like attitudes, evaluate an object, they are conceptually different from each other. Firstly, attitudes are mental predispositions and are defined as the evaluation of a particular entity (e.g. a person, object, or action) with some degree of favor or disfavor. Attitudes therefore focus on a person's positive or negative view (i.e. emotions, affect) on an object, while value orientations are patterns of basic beliefs and therefore originate from cognitions and thoughts. Secondly, value orientations are focused on general classes of objects, e.g. wildlife, whereas attitudes have a more focused object of orientation (Fishbein & Ajzen, 1975), e.g. whales (general attitude) or to the issue of commercial hunting of whales in Japan (specific attitude). Third, while a person may hold thousands of attitudes, value orientations are limited in numbers (e.g. anthropocentric - biocentric, use - protection). Identifying value orientations may assist whale watch operators and conservation groups to identify and compare target groups to which they can cater education campaigns that are aimed at reducing human impacts on the marine environment (Needham, 2010).

2.1.2 Environmental value orientations

To identify the relational values people hold to nature, many theorists have used the terms "Anthropocentric" and "Biocentric" (e.g. Fulton et al., 1996). These value orientations can be arranged along a continuum with biocentric orientations on one end and anthropocentric viewpoints on the other. Anthropocentric highlights a human-centered view of the world, in which a hierarchy exists where humans have a higher value than non-human objects (Eckersley, 1992, as cited in Vaske, 2008). This value orientation places an emphasis on the instrumental

value of natural resources for humans (Steel et al., 1994, as cited in Vaske, 2008). Even though most individuals recognize the value of humans over nature, this does not always reflect itself in a dominating sense. On the other end of the continuum is the biocentric (or biospheric) value. These values relate to a close relationship between humans and nature. People with a biocentric value orientation will primarily base their decision on whether or not to act in a pro-environmental manner on the perceived costs and benefits for the ecosystem and biosphere as a whole (De Groot & Steg, 2008). In its most pure form, absolute biocentrism is typified by the 'deep ecology' model, which regards that the needs of humans are no more important than those of any other species resulting in no distinction between the natural and human world (Glaser, 2006, as cited in Twine & Magome, 2008). Stern labeled the biocentric value orientation as having a general concern for nonhuman species and the natural environment (Stern et al., 1993). However, biocentric and anthropocentric value orientations are not mutually exclusive. The midpoint of this scale represents a mixture of the two extremes where individuals may thus exhibit a combination of values (Vaske, 2008).

The anthropocentric-biocentric continuum is similar to the use-protection continuum that is used in wildlife management literature (Needham, 2010). Fulton et al. (1996) showed that basic beliefs about wildlife use, hunting, and animal rights factor into a single value orientation dimension, which is referred to as the "wildlife use-protection value orientation." In their research, Fulton et al. (1996) were able to predict attitudes towards taking hunting trips by this value orientation. Utilitarian, or use, beliefs underline the instrumental value of a natural resource for humans rather than recognizing the inherent value of these resources (Vaske et al., 2001, as cited in Needham, 2010). The primary goal here of natural resource allocation and management is for human use, regardless of this natural resource being used as a commodity (e.g. timber) or for aesthetic, physical or aesthetic purposes, e.g. recreation (Vaske, 2008; Needham, 2010). In contrast, the value of ecosystems, species and natural resources is elevated to a prominent level within the protectionist value orientation (Needham, 2010). The inherent worth of environmental and natural resources is assumed to be respected and preserved in the protectionist approach, even when it conflicts with human-centered values (Vaske et al., 2001, as cited in Needham, 2010). This value orientation also underpins the perspective of animal rights groups who place great importance on the existence value of animals (Twine & Magome, 2008). According to the cognitive hierarchy, environmental value orientations influence someone's personal norm.

2.1.3 Norms

A norm can explain why people act in a certain way and refers to what people are doing (descriptive norm) or prescriptions for what people should do (an injunctive norm) in a given situation (Cialdini et al., 1991, as cited in Vaske, 2008). A personal norm appears to play an important role for pro-environmental behavior (Stern & Oskamp, 1987, as cited in Gärling et al., 2003). It is experienced as a perceived moral obligation to act as it creates "a general predisposition that influences all kinds of behavior taken with pro-environmental intent" (Stern, 2000, p. 413).

This study will focus on someone's personal norm emphasizing the personal feeling of moral obligation to support marine conservation. This norm is activated if the person is aware that somebody or something is in need, is aware of actions that could be helpful, perceives an ability to help, and ascribes responsibility to act to oneself (Schwartz, 1977). Ajzen (1991) claims that the intention to perform pro-environmental behavior depends on someone's personal norm.

2.1.4 Behavioral intentions

In the cognitive hierarchy theory, a person's behavioral intention is viewed as the immediate determinant of behavior and refers to an individual's intention to perform a given behavior (Fishbein & Ajzen, 1975). In the context of this study, behavioral intention is viewed as the intention to support marine environment conservation. Whale watchers might believe it is important to protect the marine environment and marine mammals and spend money to support conservation to do so, but to what extent do they want to change their behavior? For that reason, this concept will also be touched upon in this study.

However, according to Schwartz's norm-activation theory (1977), an individual must be aware of the consequences of their actions as well as feel some responsibility for their actions in order for the personal norm to be influenced. In turn, these factors influence the intention towards a certain behavior. This also means that, according to this theory, the activation of a personal norm is therefore not sufficient enough to activate a desired behavior. The personal norm that is activated can still be neutralized because the individual either denies any consequences of her actions or denies the responsibility to undertake action (Turaga et al., 2010). Gärling et al. (2003) also postulate that pro-environmental behavior intention is causally related to personal norm (PN) which in turn is causally related to ascribed responsibility (AR) and awareness of consequences (AC). For that reason, it is worthwhile to look at the Value-Belief-Norm theory by Stern et al. (1999).

2.2 Value-Belief-Norm theory

The Value-Belief-Norm (VBN) theory (Stern et al., 1999) is one of the most prominent theories of explaining voluntary pro-environmental behavior that has emerged from social scientific research (Turaga et al., 2010). The basic premise of the VBN theory holds that behavioral change results from a chain of variables that "moves from relatively stable, central elements of personality and belief structure to more focused beliefs about human-environment relations, the threats they pose to valued objects, and the responsibility for action, finally activating a sense of moral obligation that creates a predisposition to act" (Stern and Dietz, 1999, p. 85). It postulates that each variable in the chain directly affects the next and might also have an effect on variables that are further down the chain (see Figure 2). This causal order of relations has received empirical support (De Groot & Steg, 2008).

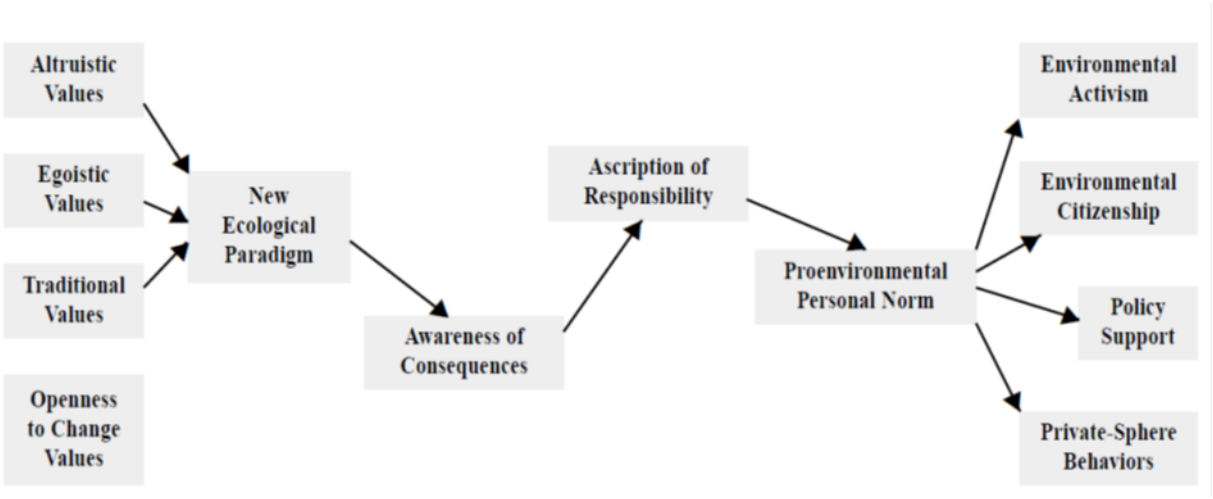

Figure 2: Schematic model of variables in the Value-Belief-Norm theory as applied to environmentalism, showing direct causal relationships between pairs of variables at adjacent causal levels (Stern & Dietz, 1999)

The general level of the VBN-model originates with someone's personal values. These values particularly relate to the extent to which someone considers the needs of others to be of importance. In the context of this study, this is labeled as the biospheric value orientation (Stern et al., 1993, as cited in Eriksson, 2008) and is represented by a concern for other species and the marine environment. Beliefs about the environment are likely predictors of a person being aware of the consequences (Christensen, 2007). When a person believes that the marine environment is important and should be protected, it is possible that this person is also more aware of the consequences of his or her behavior, which is the next part in the chain proposed by the VBN-model.

2.2.1 Awareness of Consequences

According to the VBN theory, the intention to perform pro-environmental behavior is determined by Awareness of Consequences (AC) (Hansla et al., 2008). Schwartz (1977) describes AC as the tendency to become aware of potential consequences of our behavior on other people, places, and things. AC tends to activate the feeling that action should be taken to avert or alleviate the harm and strengthen beliefs about how to behave (Stern et al., 1986). Since a perceived threat towards the marine environment should also imply a perceived threat to humankind, both the awareness of consequences of threats to the marine environment that results from human behavior, as well as the adverse consequences of environmental problems on the health of humankind, will be taken into consideration for this study. The VBN model states that an awareness of consequence should induce an ascribed feeling of responsibility for people to actually perform pro-environmental behavior (Gärling et al., 2003).

2.2.2 Ascription of Responsibility

Stern et al. (1986) describe Ascription of Responsibility (AR) as "the extent to whether a person judges himself or herself personally responsible for the positive or negative outcome" (p. 206). Schwartz (1974, as cited in Hockett et al., 2004) defines AR as the disposition to accept or deny

one's own responsibility for the consequences of his or her actions. A sense of personal responsibility has been shown to be correlated with pro-environmental attitudes as individuals that share this sense of responsibility are more likely to engage in responsible environmental behaviors (Hockett et al., 2004). Someone who denies personal responsibility is less likely to undertake actions to set things right. Although AR can be affected by information provided (Stern et al., 1986), theoretically, self-ascribed responsibility for harmful consequences can only become a moral issue when one is aware of those negative consequences (Stern et al., 1986). Taking the VBN model into account, an ascribed feeling of responsibility is assumed to activate a personal norm or a moral obligation to perform the pro-environmental behavior.

2.3 Understanding of oceans' vulnerability

Hines et al. (1986, as cited in Mustafa, 2011) state that cognitive variables pertain to the knowledge of an environmental issue. This is characterized, at least in this study context, by knowledge and/or the awareness of an environmental issue and their consequences. Persons who have this knowledge and understanding are more willing to engage in responsible environmental behavior than those who do not (Mustafa, 2011). For instance, Christensen (2007) states that "knowledge about how plastic can hurt marine animals and knowledge about how an individual can prevent this plastic from reaching the ocean by recycling is necessary before someone will perform the behavior to recycle" (p. 4). When one is made aware of this, the knowledge gained can influence any number of constructs that serve as a precursor to behavior. Or, as Hovland et al. (1953) argue, that in order to change ones attitude when being confronted with messages that try to change ones behavior, one has to do four things in order to achieve this: 1) give attention to this message; 2) comprehend the message; 3) accept the message; and 4) remember it before a change in attitude can take place. Only then will an individual act on these processes.

People who go whale watching are motivated, at least in part, by values and attitudes towards whales and the marine environment. However, there is a general consensus that the general awareness and knowledge about the ocean and issues facing the ocean is low. (Belden, Russonello and Stewart, 1999; The Ocean Project, 2009). The Centers for Ocean Sciences Education Excellence (n.d.) defines ocean literacy as "an understanding of the ocean's influence on you and your influence on the ocean." An ocean-literate person understands: (a) the essential principles and fundamental concepts about the functioning of the ocean; (b) can communicate about the ocean in a meaningful way, and; (c) is able to make informed and responsible decisions regarding the ocean and its resources. There are seven principles of Ocean Literacy which scientists and educators agree everyone should understand about the ocean:

- The Earth has one big ocean with many features.
- The ocean and life in the ocean shape the features of the Earth.
- The ocean is a major influence on weather and climate.
- The ocean makes Earth habitable.
- The ocean supports a great diversity of life and ecosystems.
- The ocean and humans are inextricably interconnected.
- The ocean is largely unexplored.

In the context of informal education, the National Environmental Education and Training Foundation lists three levels of knowledge: environmental awareness, small personal steps, and true environmental literacy (Cudaback, n.d.). Promoting Ocean Literacy during whale watch educational programs is a way to create awareness of these principles to a public with a limited understanding of them.

2.4 Hypotheses

With proponents of whale watching stating that whale watch tour influences attitudinal cognitions, the tentative hypothesis reads that participation in a whale watch tour promotes an increase in an individual's problem awareness that the health of the oceans is vulnerable (H1). If so, it can be assumed that one becomes more aware of consequences that certain behaviors have on the marine environment and marine mammals. The second hypothesis (H2) therefore predicts a positive relationship between heightened problem awareness and one's awareness of consequences. When taking into consideration the VBN-model, it can be theorized that once one is more aware of adverse consequences on the marine environment, a heightened feeling of responsibility will be induced (H3). When someone is more aware of the adverse consequences his or her own ascribed actions have on the marine environment, it is hypothesized that someone will feel a higher personal norm to take action in order to prevent behaviors that produce such consequences (H4). The VBN theory (Stern, 1999) also hypothesizes that someone will be more concerned about threats to the marine environment when this individual highly values the marine environment. This leads to examining another objective, namely to examine a relationship between the concept of whale watchers' biocentric value orientations towards the marine environment and their awareness of consequences of their behavior on the marine environment (H5). In summary:

H1: There is a positive association between participation in a whale watch tour and marine conservation issues which is translated in an understanding of the ocean's vulnerability.

H2: As understanding of ocean's vulnerability increases, awareness of consequences will increase.

H3: People with a higher awareness of consequences will share a higher ascription of responsibility.

H4: A higher personal norm to support marine conservation is found by those individuals with a higher ascription of responsibility.

H5: Whale watchers with stronger biocentric value orientations will likely be aware of the consequences of their behavior on the marine environment.

2.5 Conceptual Framework

Based on the hypotheses described above, which results from both the cognitive hierarchy and the VBN theory, as well as intuitively logical causal ordering, the model predicts that participation on a whale watch tour increases awareness of ocean's health vulnerability. This should lead to producing behavioral changes by creating a) an awareness of the consequences of human induced actions on the marine environment fostering b) a higher ascription of responsibility of one's' individual actions on the marine environment. Awareness of consequences of one's behavior and accepting responsibility for those consequences should c)

activate an obligation (personal norm) that creates a predisposition to help protect the marine environment. This, according to the cognitive hierarchy theory, should have d) a positive impact to one's behavioral intention to support marine conservation. Stern et al. (1999) also showed that beliefs about the environment predicted awareness of consequences, which is also taken into account in this framework (e). The proposed framework (see Figure 3) is therefore similar to Stern's value-belief-norm theory in making the personal norm the main basis for someone's general dispositions for pro-environmental actions, yet adding behavioral intentions from the cognitive hierarchy theory as an additional variable.

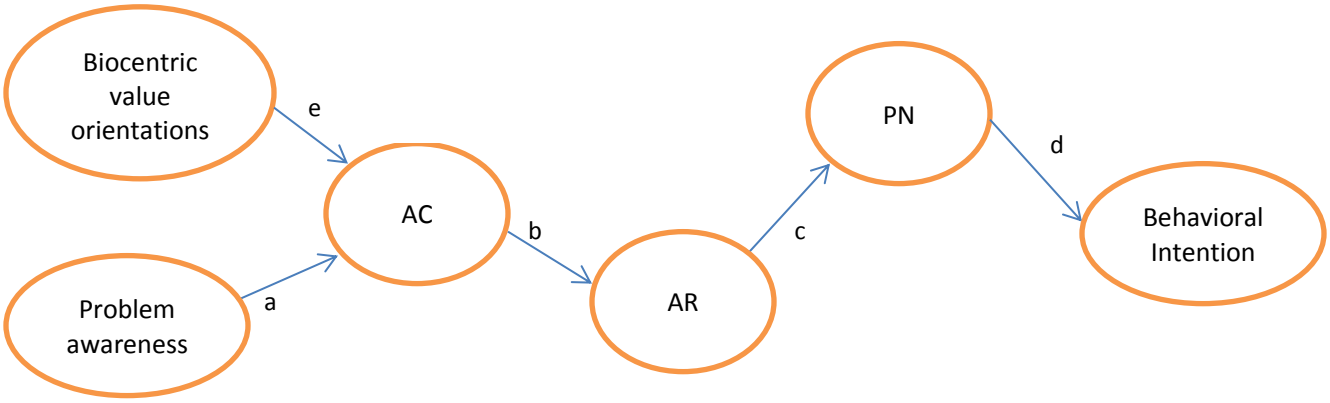

Figure 3: Hypothesized conceptual framework (AC = Awareness of consequences, AR = Ascription of Responsibility, PN = Personal Norm)

3 METHODS AND RESEARCH SETTING

The following subchapter explains the methods used to collect the data in order to answer the research questions and test the hypotheses. The first part will address the study site. The second subchapter will describe the methods of data collection and involved procedures. The third subchapter will address various limitations that potentially effect validity.

3.1 Study site

The study setting took place in the northeast region of the United States. In New England, the most popular whale-watching location is Stellwagen Bank National Marine Sanctuary (SBNMS). It consists of an 842-square-mile underwater plateau located three miles north of Cape Cod and 25 miles east of Boston. SBNMS is the only Sanctuary in the northeast region and is considered one of the premier whale watching destinations in the world (USDC et al., 2010). Multiple species of marine mammals rely on Stellwagen Bank as a seasonal feeding area, including endangered North Atlantic right whales, humpback whales, fin whales, and the protected minke whales. The colored density plots in Figure 4 shows baleen whale sightings in Stellwagen Bank National Marine Sanctuary over a 25 year period (USDC et al., 2010).

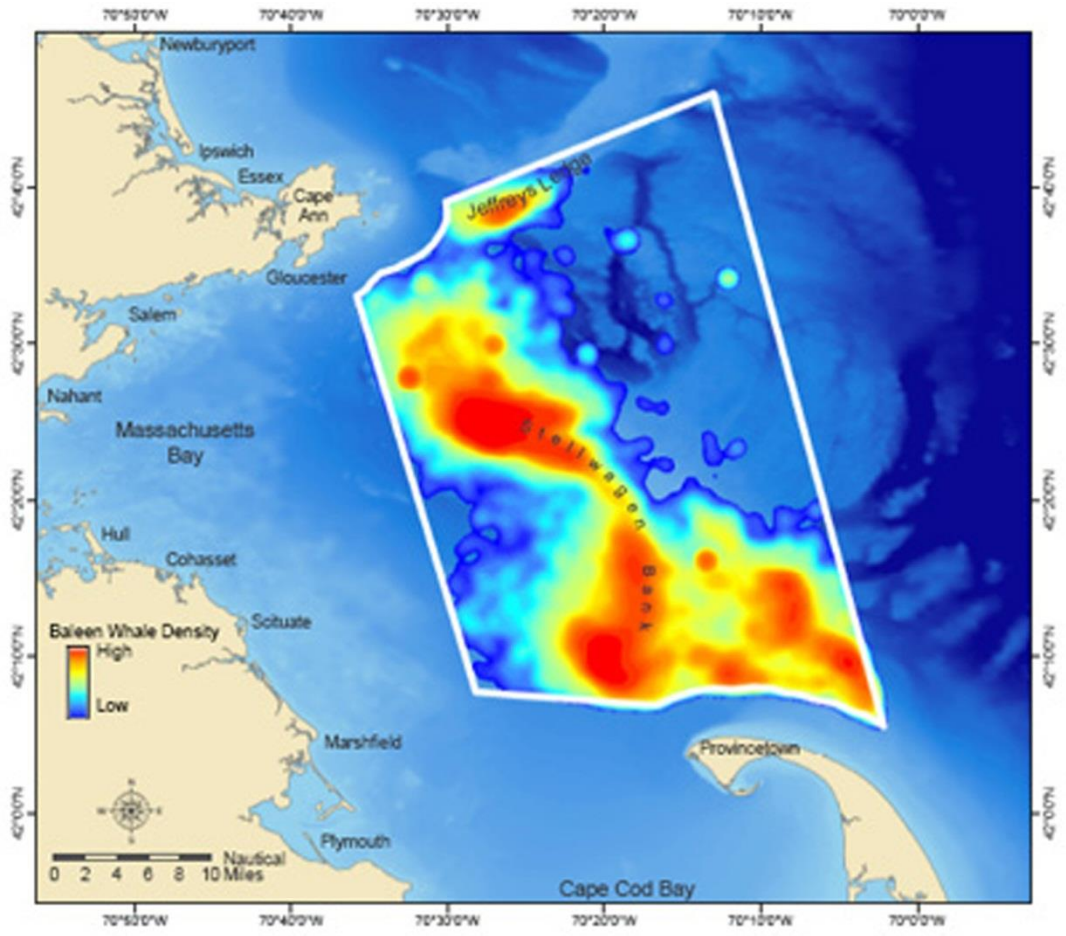

Figure 4: Stellwagen Bank National Marine Sanctuary (Credit to Michael Thompson, NOAA, 2006)

3.2 Methodology of data generation

As the goal was to assess if this form of nature-based tourism improved understanding of the ocean vulnerability and changes that occur in several cognitive constructs of participating whale watchers, questions were addressed in a pre-test/post-test design. Each respondent was asked to complete both components of the survey. Pre-tour and post-tour surveys were matched to individual respondents. The pre-trip survey had four distinct sections: 1) several short questions designed to collect their reason for choosing a whale watch tour and their level of awareness of whale viewing guidelines in New England; 2) several statements designed to measure the understanding of the concepts identified; 3) several statements designed to measure the whale watcher's level of awareness regarding the Whale SENSE program; and 4) short questions to gather data regarding the social-demographic information from respondents.

3.2.1 Procedures

The pre-trip survey (see Appendix B) was distributed before departure by WDCS-interns, who were present on the whale watch boats to collect scientific data of whale sightings and whale behavior. The pre-trip questionnaire provided the whale watchers with something to do while waiting for the boat to leave the harbor and were specifically distributed before the on board naturalist provided any narration to passengers. This allowed a comparison to answers provided by the same respondents after the whale watch experience and allowed for evaluation of any difference in knowledge and awareness of consequences as a result of the trip (see Appendix C). Changes in the level of understanding and the cognitive concepts outlined towards the marine environment could then be attributed to the impact of the whale watch tour. This method has been effective in earlier nature-based tourism research (Hughes & Saunders 2005, Powell & Ham 2008). Distributing questionnaires to whale watchers when returning to the harbor has proven to be very effective in previous studies as it gives passengers something that keeps them occupied on their journey back (Parsons et al., 2003). To safeguard a specific individual match on which a change in knowledge can be measured, respondents were asked to fill in their first name along with the initial of their surname on both the pre-trip as the post-trip.

Data were collected on board two tour operators: Captain John Whale Watching and Fishing Tours in Plymouth, MA and the Hyannis Whale Watcher in Barnstable, MA, both participating companies in the Whale SENSE program. While the latter offered two four-hour trips per day on one vessel, Capt. John typically offered three daily trips on two different vessels. Ticket prices were comparable at each company. The travel time to whales was also comparable, at approximately one hour from departure, for both operators. Whales were usually sighted within a seven to eight mile radius from Provincetown, MA. A test phase of survey distribution was done between the 20th of July, 2011, and the 25th of July, 2011 to determine the best method for explaining directions to respondents and develop a survey that would successfully obtain the best data. After some editorial decisions were made due to e.g. illogical order of some questions and maintaining a sound methodology to safeguard an individual match per individual based on the two separate surveys, data were obtained from on-site visitor surveys administered until August 24th. These months were deliberately chosen as June, July, and August are considered to be most comfortable months for whale watching out of the Boston area.

To accurately capture long term impacts of the participants' attitudes resulting from participation on a whale watch tour, a third survey questionnaire was developed. This portion of the survey was conducted at least 30 days after the trip date and was administered using SurveyMonkey, a web-based questionnaire. The online questionnaire was sent by e-mail on September 18th, 2011 and was kept open until the 3rd of October. This was done to determine if, and to what extent, the whale watch tour actually changed participants' level of awareness of consequences and their behavioral intentions between one and three months after the tour. They were also asked if they became involved in actions that they considered supportive of marine conservation. The whale watchers' e-mail addresses were requested in the pre-trip questionnaire along with an explanation as to why contacting them in a later period in time was deemed important. It was emphasized that their e-mail addresses were not used for commercial purposes but only for this study.

The technique of simple random sampling was applied in this design to safeguard a situation in which each member of the population has an equal chance of being selected as a research subject, making it is reasonable to assume the results were reflective of the general population. Due to the amount of passengers on the boat (up to 400) and the limited timeframe the WDCS interns had to distribute the survey, not all passengers could be asked to participate. High ecological validity was assumed as the materials that were used in this study were equal to the real-life situation that was under investigation, e.g. the whale watch boats and the setting of the study being the original habitat of whales.

3.2.2 Measurements

In order to cater for a high measurement validity, responses to multiple items associated with several concepts were measured on a seven-point rating scale (from 1 "strongly disagree" to 7 "strongly agree"). This choice of multiple responses could cater for a distinction between those who strongly agree with a statement from those who moderately agree with the same statement. A non-substantive response option was also included, where the score of -4- represented "neither agree nor disagree." The specific items for each of the concepts can be found in question 5 of the pre-trip survey (see Appendix B). For overview purposes, this question was edited by adding the corresponding concept to each item. Other important variables for the study context were also measured in the pre-trip survey.

One constraint to potential pro-environmental behavior is the lack of awareness of how to support marine conservation. This could ultimately limit the strength of the norm-behavior relationship. For that reason, *constraints* will be briefly touched upon in this study as well and was the final concept to be measured in question 5 of the pre-trip survey. People might show interest in supporting conservation towards the marine environment and marine mammals, but they just do not know what to do (The Ocean Project, 2009). Understanding whether people are, or are not, learning what they can do to participate in marine conservation during a whale watch trip, can help inform educators how to make their messaging more effective if they are trying to promote marine conservation. For that reason, a simple statement of "I don't know

how to help support marine mammal conservation" was asked in the pre-trip survey and this was measured on the post-trip as "I know how to support marine mammal conservation." *Wildlife viewing attitudes* were measured in question 4 of the pre-trip. Respondents were asked how important several parameters of the whale watch experience are to them by using a ranking system in which respondents could assign a value of importance to each aspect. *Whale watch experience* was deemed of importance as an independent variable as it might be possible that several constructs, e.g. value orientations towards the marine environment, may be shaped by past experiences and therefore differ per individual (Schreyet et al., 1984, as cited in Christensen, 2007). In this study, it was measured by the total amount of times that an individual had participated in previous whale watch experiences. *Demographic variables* were included as well to measure gender, age, country of residence, and level of education, which was proposed by three pre-defined options: high school; college; graduate school/university.

3.2.3 Limitations

Several limitations in this study must be considered. One important limitation is that participants on a whale watch tour are tourists. Tourists may regard their whale watching trip as a passive form of ecotourism, which in this case occurs when the tourists are entertained by seeing a whale and enjoy the experience with their family and/or friends while minimizing their impact on the environment (Orams, 1995). The goal of interpretation in this study is to determine if the visitor is moved towards actively contributing to a long-term healthy marine environment. Although a whale watch tour is considered to be a learning environment, the participants in this setting are not students that need to learn or feel the need to pay attention in order to get a sufficient grade for an upcoming exam. Or, as Lück (2003, p. 944) has summarized, ''environmental education involves students while environmental interpretation involves visitors.'' It must be noted that a whale watch boat is not a formalized learning environment where retention of information leads to effective education (Greenwald, 1968), and that tourists are considered to be both a non-attentive (Lück, 2003; Rasoamampianina, 2004) and non-captive (Ham, 1992; Orams, 1999, as cited in Lück, 2003) audience. Although the results of studies vary, Rasoamampianina (2004) has also stated that, in many cases, tourists are not primarily interested in learning. Typically, they will listen to or read information only if they wish. Therefore whether or not the interpretation has had an effect on the passengers' cognitive constructs being influenced, is dependent on whether they chose to listen to the information provided to them. As a result, it is not retention that leads to an effective learning environment on a whale watch boat, but rather whether the interpretation was appealing and persuasive (Greenwald, 1968).

Another limitation has to do with linguistics. As this study took place in the United States of America, these surveys were written in English. As a consequence, non-English speaking whale watchers may not have understood all the questions, especially those questions that addressed several concepts of importance. For that reason, a large number of international individuals declined to participate or did not complete the survey. Additionally, a small number of passengers declined to participate in the post-trip survey due to sea-sickness, sleeping upon the return trip or non-interest.

4. FINDINGS AND ANALYSIS

Descriptive and statistical methods were used to analyze the primary data that were collected from the pre-trip and post-trip questionnaires. Descriptive methods such as measures of averages and percentages and statistical methods in the form of factor analysis, reliability tests, correlations, regression analyses and one-paired sample *t*-test were used to analyze the data and to answer the research questions. The overall analysis is based on four parts. First of all, a background analysis was made of selected demographic variables of the participants. This was done in order to have a closer look at the profile of the whale watchers. Independent analyses of the several dependent variables cover the second part. For the third part in the overall analysis, a regression analysis was executed in order to examine whether or not the assumptions of the adapted VBN-model in this study held true. The fourth part looked at the impact a whale watch tour has in the short term as well as in a longer time frame. Paired sample *t*-tests were executed between data from the pre-trip surveys and the post-trip surveys to determine whether changes occurred or did not occur. This section also investigated if demographics and someone's whale watch experience are of influence on the several concepts measured in this study.

4.1 Whale watchers' profile

Analyses were conducted to identify the frequencies and percentages of selected demographic and background variables of the participants. A total of 1087 individuals were included in this study. Depending on various missing values, the total number of participants differs on various analyses, including the descriptive analyses depicted below.

4.1.1 Demographics

Out of the 1087 whale watchers, nearly half of this sample (47%) had not experienced a whale watch trip before. Almost a quarter (23.2%) indicated that they had only been on one previous whale watch and a small percentage (3.6%) had experienced more than ten whale watches. The majority of respondents were women (61.4%) and the average age was 39 (n=937) where the most frequently occurring age was 41. The age range was 77 years with the oldest research subject 85 years of age. Taking the human developmental stages of Erik Erikson (1968) in perspective (see Table 1), most research subjects were considered middle aged adults (48.6%).

Table 1: Age groups (ordered by Erik Erikson's stages of human development)

	Frequency	Percentage
Children (8 – 12 years)	35	3.7
Teenagers (13 – 19 years)	121	12.9
Young adults (20 – 40 years)	264	28.2
Middle aged adults (40 – 64 years)	455	48.6
Older adults (65 years and older)	62	6.6
Total	937	100

A contingency table, which excluded children, was created to display the relationship between age groups and their whale watch experience (see Table 2). As expected, most teenagers were experiencing their first whale watch. More than half of the whale watchers that had been on more than ten whale watches, and thus can be regarded as well-experienced whale watchers, were middle aged adults.

Table 2: Whale watch experience related to age groups

	1st time	2nd time	3rd time	3 – 10 times before	> 10 times
Teenagers	76 (18.0%)	17 (8.4%)	11 (13.8%)	15 (9.0%)	2 (6.7%)
Young adults	130 (30.7%)	59 (29.1%)	24 (30.0%)	47 (28.3%)	4 (13.3%)
Middle aged adults	198 (46.8%)	114 (56.2%)	38 (47.5%)	88 (53.0%)	17 (56.7%)
Older adults	19 (4.5%)	13 (6.4%)	7 (8.8%)	16 (9.6%)	7 (23.3%)
Total	423 (100%)	203 (100%)	80 (100%)	166 (100%)	30 (100%)

The highest level of formal education reported by the majority of respondents was college (42.8%), followed closely by graduate school/university (35.5%) and high school (21.7%). As there was a small percentage of children in the random sample (3.7%), but was excluded for analysis purposes. The majority of research subjects were from the Unites States of America (82.9%), representing a total of forty-four states and the District of Columbia, with the majority (33.1%) being from the state of Massachusetts followed by the neighboring states of New York (9.6%) and Connecticut (6.7%). Therefore, the majority of respondents could be considered to be local due to their proximity of the whale watch operators. Europeans represented 13.9% of the sample, of which 96.6% were from Western European countries[1] and 3.4% from Eastern European countries. U.K. Citizens made up 5.7% of the total sample, making them the second largest group of nationalities after Americans. Canadians represented the third biggest group of respondents, with 2.7% of the total. The remaining 0.5% included Chinese, Indian and Peruvian respondents.

4.1.2 Reason to choose whale watch company

Several options were given in the pre-trip survey regarding the reason passengers chose their trip/whale watch company. The primary reason given was proximity to where they lived/were staying (43.5%). Nearly one in four (24.7%) respondents followed the recommendation of their friends and/or family members. Additional reasons accounted for 9.5% of responses, which included coupons ("BuyWithMe" deals), most informative website (Hyannis Whale Watch), internet reviews, recommended by a tour operator, or from brochures from the American

[1] As defined by the United Nations Regional Groups

Automobile Association. Previous experience with a particular tour operator was also noted as being one of the main reasons to choose their current operator (9.1%).

It is not known whether whale watchers picked a specific operator due to this operator being closely located to their accommodations or because whale watchers had picked their accommodation to be closer to their preferred whale watch operator. Taking Table 3 into account, the significance of proximity should be investigated further. Respondents who were on their first or second whale watch tour mainly based their choice on proximity and recommendation from friends and/or family.

Table 3: Main reason for whale watchers to choose their tour operator

	1st time	2nd time	3rd time	3 – 10 times before	> 10 times	Total
Proximity	214	117	42	67	17	457 (43.5%)
Recommendations friends/family	161	49	18	27	4	259 (24.7%)
Previous experience	4	27	12	47	6	96 (9.1%)
Whale sightings update	15	11	6	4	2	38 (3.6%)
Recommended by hotel	26	7	2	3	0	38 (3.6%)
Groupon	10	8	2	7	2	29 (2.8%)
Ticket price	8	5	4	2	0	19 (1.8%)
Affiliation with conservation group	2	3	0	4	3	12 (1.1%)
Other	48	19	10	21	5	103 (9.8%)
Total	488	246	96	182	39	1051

4.1.3 Awareness of existing guidelines

The pre-trip survey questioned awareness of whale watching guidelines. Respondents were asked whether they knew the recommended distance of approach to a humpback whale in New England. The majority (48.7%) was unaware of the correct distance with only 12.7% of the respondents either knowing or guessing the 100 feet distance correctly from several options provided. A total of 34.7% thought the distance recommendation was greater than 100 feet. This suggests that while the distance may not be known, the awareness that some recommended approach distance existed. This is in comparison to 3.9% of respondents who believed one can approach a humpback whale in New England as close as possible, of which the majority had their highest level of formal education in college. To elaborate on this, it was interesting to explore how important it was for whale watchers to approach the whales as close as possible.

4.1.4 Wildlife viewing attitudes

The question of how important it is for whale watchers to approach whales as closely as possible as compared to having e.g. approach guidelines in place (which benefits the whales) was examined (see Table 4 for the other aspects). As previously discussed, one must consider the willingness of the whale watcher to actively learn during the trip (see chapter 3.2.3) This provided an additional reason to ask whale watchers if they were interested in learning about a) whale biology, b) whale conservation, c) the marine environment, and d) what they could do to

help support marine conservation. Although these attitudes could change after a whale watch tour, they were only considered significant initially in part one of the survey. As seen in Table 4, with a mean of 1.00 regarded as "not important at all" and 4.00 being very important", it can be concluded that on average, whale watchers rate all of the items as important (*n* = 1033).

Table 4: Wildlife viewing attitudes

	Mean	St. dev.
Having the boat maintain a safe distance from the whales	3.44	.858
Knowing that the boat is following guidelines	3.30	.908
Being as close to the whales as possible	3.27	.853
Seeing other wildlife, e.g. birds and seals	3.16	.804
Learning about whale conservation	3.12	.809
Learning about the marine environment	3.06	.810
Learning about whale biology	3.02	.838
Learning how to get involved in marine conservation	.254	.970

The most important aspect to the whale watchers in this study was having the boat maintain a safe distance from the whales and knowing that the boat was following guidelines, which was regarded as being more important than being as close to the whales as possible. On average, all four items that touched upon the importance of learning something on a whale watch tour were regarded of least importance, albeit still of importance. Learning about whale conservation was deemed most important to learn, followed closely by learning about the marine environment and whale biology. Learning how one can be involved and help support marine conservation was rated least important compared to the measured aspects, with an average mean that ranged between "important" and "not important."

It is also of interest to look at the difference between those whale watchers who were on their first whale watch and those more experienced whale watchers. It was assumed that the well-experienced seasonal whale watchers would not prioritize being as close to the whales as possible as important as first-timer whale watchers. The reasoning for this lies in the idea that, due to their experience, seasonal whale watchers have seen whales before and would therefore feel less enticed to be as close to whales as first times, understand the variability in trips, species, and whale behavior, or have been exposed to conservation messages onboard other whale watch trips that would have supported keeping safe distances from the whales. A chi-square analysis (see Table 5) was used in order to determine if this was true or not.

Table 5: Being as close to the whales as possible * Whale watching experience

	1st time	2nd time	3rd time	3 – 10 times before	> 10 times	Total
Not at all important	17 (3.4%)	15 (6.1%)	4 (4.4%)	5 (2.7%)	3 (7.9%)	44 (4.2%)
Not important	66 (13.3%)	29 (11.7%)	17 (18.7%)	33 (17.9%)	3 (7.9%)	148 (14.0%)
Important	162 (32.5%)	81 (32.8%)	29 (31.9%)	60 (32.6%)	12 (31.6%)	344 32.5%)
Very important	253 (50.8%)	122 (49.7%)	41 (45.1%)	86 (46.7%)	20 (52.6%)	522 (49.3%)

As expected, a large majority of first time whale watchers prioritized being as close to whales as possible as important (a cumulative 83.3%), with more than half of them (50.8%) finding this to be very important. However, the percentage of whale watchers that found it important to be as close to the whales as possible did not decrease with an increase in whale watching experience, as was expected. Instead, more than half of those whale watchers who had been whale watching more than 10 times found this to be more important than those first times.

4.1.5 Awareness of Whale SENSE

The level of awareness with regards to recognizing the Whale SENSE logo was low, with 81.8% of respondents not recognizing the logo at all (n = 1063). Out of those respondents that did recognize the logo, respectively 15.9%, 16%, and 5.2% either noticed it on the companies' ticket booth, in a brochure and/or on the boat. A small percentage also stated that they had seen the logo before in various other places, e.g. on the operator's website, in the Hyannis Whale Watcher's gift shop, in the New England Aquarium, and in the Nantucket Whaling Museum. While neither the Aquarium or the Nantucket Whaling Museum is a formal partner of the program, it is possible that brochures were distributed at events taking place at these locations. It is also possible that a similar logo was on display or the respondents misremembered where they had seen it. It is also important to note that 91% of respondents stated that they would take Whale SENSE into consideration when choosing a company for their next whale watch tour. Two people stated that they would take the Whale SENSE program into consideration for their next whale watch trip unless the ticket price would increase. One additional question, which was inserted in the pre-trip survey at a later stage, asked the level of importance for whale watchers to know that the naturalist and captain received specialized whale watch training (not specific to Whale SENSE). This question considered if the intent of the SENSE program was of importance to passengers, even if passengers did not have specific knowledge of the program. With a mean of 3.35 out of 4 (SD = .638, n = 339), it indeed showed that whale watchers, on average, deem this to be very important, with women finding this more important than men. Taking Table 4 into perspective, it shows having the boat maintain a safe distance from whales would be the only item regarded as more important than specialized training, for whale watchers to consider before choosing their company.

4.2 Independent analysis of conceptual framework

Factor analysis was performed to test whether variables measuring several concepts (i.e., value orientations) provided a good fit and demonstrated construct validity. Construct validity refers to "the way indicators and concepts relate to one another within a system of theoretical relationships" (Vaske, 2008, p. 71). Measurement reliability is one of the basic properties of measurement and is defined as "the consistency of responses to a set of questions (i.e. variables) designed to measure a given concept" (Vaske, 2008, p. 516). Internal consistency in the pattern of the respondents' answers of multiple-item indices measuring several concepts was examined with Cronbach alpha reliability coefficients (symbolized by α). As the variables in these multiple-item indices were measured on a seven-point scale (1 "strongly disagree" to 7 "strongly agree") and there were for example, three items that measured the "awareness of the oceans vulnerability", the maximum overall score a whale watcher could thus achieve on this specific concept was 21. In order to make the interpretation of the scores easier, these total scores per individual were computed to an average score. Because the maximum score one could attain was 7, the arbitrary cut point was designated as 3.5. Correlations, independent *t*-tests and One-Way Analysis of Variance (ANOVA) were performed in order to see if there was dependency with independent variables (i.e. demographic variables, ones whale watch experience). Effect sizes were also calculated, which is defined as the strength of a relationship between an independent variable and the dependent variable (Vaske, 2008). It can be seen as an indicator for practical significance, showing if an observed association is strong, important and meaningful (Vaske, 2008).

4.2.1 Value Orientations

4.2.1.1 Skill analysis

Factor analysis was conducted to investigate item correlations in order to observe whether measures of the specific value orientations are consistent with the understanding of the nature of that construct, which was expected on the basis of pre-established theory (e.g. Needham, 2010). Factor analysis resulted in the expected and satisfactory two-factor solution (n = 1047, Varimax rotation and EV > 1, cases excluded list wise, Inter-item correlations r > 0.4 were excluded), with all variable loadings exceeded .40. The variables that strongly correlated with Factor 1 were the four anthropocentric "use" basic beliefs, with an average correlation among the four variables of .438 and 33.1 % of the variance explained. Factor 2 contained the three expected biocentric "protectionist" basic belief variables and measured an average correlation among the three item-variables of .386. (25.3% explained variance). See Table 6 for an overview.

Table 6: Factor loadings and Cronbach α's of Environmental Value Orientations

	Factor loadings	
Items	*1*	*2*
"Use" Value Orientation (α = .74)		
The primary purpose of the marine environment should be to benefit people	.780	
The needs of humans are more important than the marine environment	.770	
Recreational use of the marine environment is more important than protecting the species that live there	.745	
Humans should manage the marine environment such that humans benefit	.697	
"Protectionist" Value Orientation (α = .65)		
The marine environment should be protected for its own sake rather than to meet the needs of humans		.811
The marine environment has value whether humans are present or not		.760
Recreational use of the marine environment should not be allowed if it damages the area		.675
Explained variance	33.1%	25.3%

The Cronbach's alpha reliability coefficient was used to examine the internal consistency of the biocentric and anthropocentric basic belief scales. Whale watchers who strongly agree that "the marine environment has value whether humans are present or not" are also likely to agree that "the marine environment should be protected for its own sake rather than to meet the needs of humans" and "recreational use of the marine environment should not be allowed if it damages this area" as all three load up on the same factor. It thus calculates the extent to which these multiple-item indicators measure each of the two value orientations, intercorrelate with each other, and reflect this underlying concept. The reliability analysis indicated that the four items that reflect the "use" value orientation had an acceptable level of internal consistency (Cronbach's α=.743). The internal reliability within the "protectionist" value orientation turned out to be sufficient as well (α=.653). As both Cronbach alpha coefficients are in fact ≥ .65, it provides a reliable estimate of the systematic, or internal consistency, of these variables in a set of survey responses, which reflects measurement reliability (Vaske, 2008). Therefore, these seven items indeed measured two different concepts and combining these items into two single factors is justified.

For that reason, two composite basic belief scales were then computed to create the anthropocentric/biocentric value orientation continuum. One end of this continuum reflected

people who predominantly shared an anthropocentric value orientation and view the marine environment as "material to be used by humans as they see fit" (Scherer & Attig, 1983, as cited in Vaske, 2008). This represents a human centered view of the nonhuman world (Eckersley 1992, as cited in Vaske, 2008). The other end of the continuum included individuals who were mostly biocentric in their orientation towards the marine environment. These individuals agreed with statements which supported protecting the marine environment more strongly and shared a nature centered, or eco-centered approach, where the intrinsic value of the environment was strongly valued as well.

4.2.1.2 Descriptives

On average, whale watchers moderately agreed with the biocentric belief of protecting the marine environment, with a mean of 5.88 on a seven-point summated scale. Out of the three items that were used to measure the biocentric view (see Table 7), whale watchers most firmly agreed that the marine environment has value whether humans are present or not. This belief was followed closely with the tendency to moderately agree with the belief that the marine environment should be protected for its own sake rather than to meet the needs of humans, and that recreational use of the marine environment should not be allowed if it damages this area.

Table 7: Descriptives statements "Value Orientations"

	Mean	St. dev.	*n*
Biocentric Average	5.88	1.268	1065
The marine environment has value whether humans are present or not	6.01	1.696	1071
The marine environment should be protected for its own sake rather than to meet the needs of humans	5.80	1.633	1077
Recreational use of the marine environment should not be allowed if it damages this area	5.80	1.643	1078
Anthropocentric Average	2.26	1.251	1061
Recreational use of the marine environment is more important than protecting the species that live there	1.70	1.387	1081
The needs of humans are more important than the marine environment	2.14	1.526	1078
The primary purpose of the marine environment should be to benefit people	2.22	1.680	1078
Humans should manage the marine environment so that humans benefit	3.02	2.028	1068

* Cell entries are means on a 7-point scale of 1 "strongly disagree" to 7 "strongly agree."

Whale watchers generally disagreed that the marine environment is primarily for human use. Taking the four items that measure this anthropocentric "use" dimension into account, they disagreed the strongest, albeit moderately, with believing that recreational use of the marine environment is more important than protecting the species that live there. Although whale watchers disagreed the least with believing that humans should manage the marine environment so that humans benefit, this statement did solicit the largest variance in responses.

Descriptive statistics show that females shared a stronger biocentric approach than males. However, no significant difference was found in an independent *t*-test (see Table 8). A

significant difference between genders was discovered based on the summated anthropocentric use index scale, with males being more anthropocentric oriented. Cohen's *d* indicated a minimal relationship (Vaske, 2008). The level of formal education also correlated with biocentric viewpoints towards the marine environment, with a significant difference found between those individuals whose highest level of formal education was high school and both college and graduate school/university. However, the difference was rather small (η=.118).

Table 8: Inferential statistics "Value Orientations"

Biocentric Value orientations		Mean	St. Dev.	*n*	*t*(df) or F	*p*	Effect size
Gender	Female	5.93	1.279	648	*t* = -1.763 (1056)	.078	.11
	Male	5.79	1.241	410			
Age	Teenagers	5.70	1.415	121	F = .993	.396	.058
	Young adults	5.91	1.171	257			
	Middle aged adults	5.91	1.229	448			
	Older adults	5.87	1.419	62			
Education*	High school	5.64	1.511	215	F = 6.902	.001	.118
	College	5.88	1.273	421			
	Graduate school/University	6.04	1.038	351			
Experience	First time	5.81	1.283	496	F = 1.557	.184	.076
	Second time	5.91	1.255	248			
	Third time	5.97	1.217	97			
	Three to 10 times before	6.02	1.197	185			
	More than 10 times before	5.62	1.549	39			
Anthropocentric Value orientations		Mean	St. Dev.	*n*	*t*(df) or F	*p*	Effect size
Gender *	Female	2.14	1.225	647	*t* = 4.146 (1052)	.001	.26
	Male	2.46	1.271	407			
Age	Teenagers	2.30	1.191	119	F = 1.598	.188	.074
	Young adults	2.13	1.196	259			
	Middle aged adults	2.27	1.297	445			
	Older adults	2.48	1.368	61			
Education	High school	2.40	1.270	210	F = 2.183	.113	.067
	College	2.18	1.283	422			
	Graduate school/University	2.28	1.193	348			
Experience	First time	2.35	1.206	498	F = 2.041	.087	.088
	Second time	2.23	1.297	247			
	Third time	2.00	1.123	94			
	Three to 10 times before	2.16	1.315	184			
	More than 10 times before	2.34	1.435	38			

* significant at the 0.01 level

4.2.1.3 Conclusion

As noted by Vaske (2008), biocentric and anthropocentric value orientations are not mutually exclusive, which this study also proves. The midpoint of the continuum represents a mixture of the two extremes, which, for this study, consisted of 135 individuals (see Table 9).

Table 9: Overview "Value Orientations"

	Frequency	Percentage
Neither anthropocentric nor biocentric oriented	37	3.5
Anthropocentric oriented	25	2.4
Biocentric oriented	853	81.2
Both anthropocentric as biocentric oriented	135	12.9
Total	1050	100

Out of the 1050 research subjects, 988 shared a biocentric value orientation, of which 853 solely shared the biocentric viewpoint. Twenty-five whale watchers were found to view the environment as solely having value as natural resources for humans, rather than recognizing the inherent value of the environment. Thirty-seven whale watchers were more ambivalent regarding their beliefs towards the marine environment than the others, having neither an anthropocentric nor a biocentric approach. The previous analysis showed that both gender as well as formal education levels had somewhat of an influence on an individual's pattern of belief towards the marine environment being either anthropocentric or biocentric oriented.

4.2.2 Problem Awareness

4.2.2.1 Skill Analysis

Three statements were set up to measure the concept of awareness of ocean vulnerability (as adapted from Belden, Russonello and Stewart, 1999). All three items showed an acceptable level of internal consistency (Cronbach's α=.765, see Appendix D) with a correlation of .525.

4.2.2.2 Descriptives

Due to the wording of the three statements regarding the concept of awareness of ocean vulnerability, those research subjects who disagreed with the statements were considered to be aware of the problem. The lower the level of agreement (< 3.5 on a seven-point scale) on these statements, demonstrated a stronger sense of awareness of understanding that the marine environment is vulnerable. With an average mean of 1.78 (see Table 10) for the summated rating index, it is suggested that respondents were moderately aware of the oceans' vulnerability.

Table 10: Descriptives statements "Problem Awareness"

	Mean [a]	St. Dev.	*n*
We do not need to worry about the oceans' health because we will develop new technologies to keep them clean	1.66	1.267	1079
Oceans are so large, it is unlikely that human will cause any lasting damage to them	1.70	1.486	1082
Polluted oceans are able to clean themselves	1.96	1.404	1075
Average level of awareness of the oceans' vulnerability	1.78	1.158	1084

a) a lower level indicates a stronger perception of the problem

The majority (92.7%) of respondents rejected the idea that we do not need to worry about the health of the oceans because we will develop new technologies to keep them clean. Nine in ten

(89.3%) of the research subjects disagreed that the oceans are so large, it is unlikely that humans will cause lasting damage to them. And the statement that polluted oceans are able to clean themselves was rejected by 86.6%. .

Table 11 shows that females seemed to be significantly more aware of the oceans' vulnerability than males. However, a very weak relationship was detected between gender and problem perception (*d* = .03) Age also seemed to be an influencing a factor. Young adults were found to have a significantly higher level of awareness than other age classes while older adults were the least aware of the oceans' vulnerability (see Appendix F). However, a minimal association was also detected here (η=.110). Those individuals who completed graduate school/university levels of education had a higher level of awareness than those who only finished high school and/or college, yet no significant differences were detected. Interestingly, data showed that the group with the least level of awareness of the vulnerability of the ocean's health was that group of individuals who had been on more than ten whale watches.

Table 11: Inferential statistics "Problem Awareness"

		Mean	St. Dev.	*n*	*t*(df), or F	*p*	Effect size
Gender*	Female	1.69	1.103	661	*t* = 2.955 (810.466)	.003	.03
	Male	1.91	1.231	416			
Age*	Teenagers	1.84	.9757	121	F = 3.658	.012	.110
	Young adults	1.60	.8400	263			
	Middle aged adults	1.80	1.230	454			
	Older adults	2.06	1.510	62			
Education	High school	1.89	1.189	218	F = 1.890	.152	.061
	College	1.81	1.248	428			
	Graduate school/University	1.70	1.048	356			
Experience	First time	1.81	1.092	510	F = 1.583	.177	.076
	Second time	1.84	1.312	250			
	Third time	1.56	1.004	97			
	Three to 10 times before	1.68	1.165	188			
	More than 10 times before	1.91	1.228	39			

* significant at the < 0.05 level

4.2.2.3 Conclusion

Two scales were computed to determine the specific number of research subjects who were aware of the oceans' vulnerability (see Table 12). Of the 1084 whale watchers who responded, 92.2% were aware of the ocean's vulnerability as they either strongly, moderately or slightly disagreed with the three statements mentioned (with a mean of 3.5 as arbitrary cut-point). As the previous analysis depicted, females and young adults showed significantly high levels of awareness of the ocean vulnerability.

Table 12: Overview "Problem Awareness" before whale watch tour

	Frequency	Percentage
Aware of the vulnerability of the oceans	999	92.2
Not aware of the vulnerability of the oceans	85	7.8
Total	1084	100

4.2.3 Awareness of Consequences

4.2.3.1 Skill Analysis

All four items, which were meant to jointly account for the concept of Awareness of Consequences (AC), shared an average correlation among each other of .433 and had an inter-item reliability of α=.751. Removing one single item did not improve the reliability coefficient and did not dramatically change the number of research subjects (see Appendix D). Two of the four items measured AC that specifically impacted marine mammals. This was done in order to observe if there was a difference in AC towards the more general marine environment versus, more specifically, marine mammals.

4.2.3.2 Descriptives

With a high percentage of whale watchers being aware of the ocean's vulnerability on some level (92.2%, see Table 12), one would assume that these individuals are worried about the health of the environment. As expected, Table 13 shows that the whale watchers were, on average, moderately worried about the health of the marine environment, whereas descriptive statistics show that almost four in ten (36.9%) were very worried about the health of the marine environment. Individuals most strongly agreed with the belief that the loss of marine mammals can have a negative effect on the health of human beings. Although still considerably high on levels of agreement, one was less inclined to believe that the use of personal cleaning products in their house can have a negative effect on the marine environment.

Table 13: Descriptives statements "Awareness of Consequences"

	Mean	St. Dev.	*n*
The loss of marine mammals can have a negative effect on the health of human beings	5.69	1.509	1053
I am worried about the health of the marine environment	5.63	1.444	1028
A lot of species of marine life will become extinct within the next few decades	5.32	1.438	686
Cleaning products that I use in my house on a daily basis can have a negative effect on the marine environment	5.29	1.672	726
Average level of Awareness of Consequences	5.55	1.194	1075

Cell entries are means on a 7-point scale of 1 "strongly disagree" to 7 "strongly agree."

Table 14 (see below) shows that significant differences were observed between one or more age groups, where middle aged adults were more aware of adverse consequences than teenagers and young adults (see Appendix G). Additionally, the level of education was noteworthy, with a statistically significant difference between those individuals who went to graduate school/university as compared to those whose highest level of formal education was

high school (see Appendix H). Both effect sizes indicate a minimal relationship (Vaske, 2008), indicating a limited importance of age and education level on awareness of consequences.

Table 14: Inferential statistics "Awareness of Consequences"

		Mean	St. Dev.	*n*	*t*(df), or F	*p*	Effect size
Gender	Female	5.56	1.207	655	*t* (1066) =-.600	.548	.04
	Male	5.52	1.160	413			
Age*	Teenagers	5.29	1.033	121	F = 3.391	.007	.117
	Young adults	5.48	1.125	262			
	Middle aged adults	5.67	1.181	452			
	Older adults	5.64	1.361	62			
Education*	High school	5.37	1.196	218	F = 4.853	.008	.098
	College	5.55	1.194	427			
	Graduate school/University	5.68	1.128	353			
Experience	First time	5.50	1.180	507	F = .930	.446	.059
	Second time	5.53	1.223	246			
	Third time	5.59	1.281	97			
	Three to 10 times before	5.69	1.126	187			
	More than 10 times before	5.54	1.313	38			

* significant at the <0.05 level

4.2.3.3 Conclusion

Table 15 shows that 93.2% of whale watchers in this study were aware of adverse consequences on the marine environment before their whale watch tour began, whereas 6.8% were not. This finding is very similar to the results regarding passenger "Awareness of the Oceans' Vulnerability" (see Table 12).

Table 15: Overview "Awareness of Consequences" before whale watch tour

	Frequency	Percentage
Aware of adverse consequences on the marine environment	1002	93.2
Not aware of adverse consequences on the marine environment	73	6.8
Total	1075	100

On average, AC was moderate across the study sample, with middle aged adults sharing significantly higher levels of awareness of adverse consequences on the marine environment than teenagers and young adults. Another significant difference was observed between higher levels of awareness in those individuals who went to graduate school/university compared to those whose highest level of formal education was high school.

4.2.4 Ascription of Responsibility

4.2.4.1 Skill analysis

To measure Ascription of Responsibility (AR), a four-item scale was used which was adapted from previous studies (e.g. Koper, 2009) and which was applicable in the context of whale

watching. However, factor analysis showed that the four items that were meant to measure AR reflected two different underlying factors instead of one (see Table 16). Factor 1 seemed to resemble a feeling of AR that focused on individuals feeling jointly responsible for threats to both the marine environment and the marine mammals inhabiting in that environment, which can be defined as "joint human responsibility." This explained 38.4% of the variance with just two items. Factor 2 reflected one's personal approach to AR and was therefore labeled as "personal/individual-looking" and explained 30.0% of the variance. Even though inter-item correlations in both factors scored higher than .70, reliability was not strong as there are only two items loading on each factor, with the second factor having a Cronbach Alpha of only .37. It was therefore more reliable to continue on the overall analysis of all four items combined in AR.

Table 16: Factor loadings and Cronbach α's of "Ascription of Responsibility"

	Factor loadings	
Items	*1*	*2*
"Joint human responsibility" (α = .70)		
I feel at least co-responsible for threats to marine mammals	.871	
I am jointly responsible for threats to the marine environment	.867	
"Personal/individual-looking" (α = .37)		
My contribution to pollution into the marine environment is negligible		.784
I believe the government has the task to protect the marine environment, not me		.754
Explained variance	38.4%	30.0%

4.2.4.2 Descriptives

On average, whale watchers in this study only slightly agreed with taking responsibility for the marine environment. They most strongly believed that they, as individuals, also have the task to protect the marine environment instead of it solely being a governmental task. This was followed by the two statements that touched upon one being co-responsible for threats to the marine environment and marine mammals (see Table 17).

Table 17: Descriptives statements "Ascription of Responsibility"

	Mean	St. Dev.	*n*
I believe the government has the task to protect the marine environment, not me	5.14	1.776	1016
I am jointly responsible for threats to the marine environment	4.98	1.760	1013
I feel at least co-responsible for threats to marine mammals	4.63	1.734	722
My contribution to pollution into the marine environment is negligible	4.60	1.789	990
Average level of ascribed feeling of responsibility	4.89	1.182	1072

Cell entries are means on a 7-point scale of 1 "strongly disagree" to 7 "strongly agree."

While several significant relationships between AR and certain demographic variables were found, their importance is limited due to their small effect sizes indicating a minimal relationship (see Table 18). First of all, a higher level of ascribed feelings of responsibility was observed between adults and teenagers, where all three groups of adults shared a significantly higher feeling of responsibility than teenagers. A significant difference was also found between young- and middle aged adults (see Appendix I). Research subjects whose highest formal level of education was high school felt significantly less responsible than those who went to college and graduate school/university (see Appendix J).

Table 18: Inferential statistics "Ascription of Responsibility"

		Mean	St. Dev.	*n*	*t*(df), or F	*p*	Effect size
Gender	Female	4.94	1.218	655	*t*(933.151) = -1.598	.110	.09
	Male	4.82	1.105	411			
Age***	Teenagers	4.55	1.064	121	F = 6.426	<.001	.145
	Young adults	4.83	1.135	262			
	Middle aged adults	5.02	1.177	451			
	Older adults	5.13	1.114	62			
Education**	High school	4.68	1.123	218	F = 6.959	.001	.118
	College	4.92	1.176	426			
	Graduate school/University	5.05	1.158	353			
Experience*	First time	4.77	1.162	504	F = 2.582	.036	.098
	Second time	5.03	1.226	246			
	Third time	4.95	1.124	97			
	Three to 10 times before	4.99	1.137	187			
	More than 10 times before	4.93	1.399	38			

* significant at the < 0.05 level
** significant at the 0.01 level
*** significant at the < 0.01 level

4.2.4.3 Conclusion

Overall, 88% of the whale watchers felt an ascribed feeling of responsibility before their trip (see Table 19).

Table 19: Overview "Ascription of Responsibility" before whale watch tour

	Frequency	Percentage
Feeling ascribed responsibility	944	88.1
Not feeling ascribed responsibility	128	11.9
Total	1072	100

Higher levels of ascribed feelings of responsibility were observed in adults compared to teenagers, as well as those individuals who went to college and graduate school/university as compared to those whose formal education level was high school. Data also showed that individuals who were experiencing their first whale watch tour shared less of an ascribed feeling of responsibility than those who had been whale watching previously.

4.2.5 Personal Norm

4.2.5.1 Descriptives

Out of 1059 individuals, 64.6% expressed a feeling of personal obligation to protect the marine environment, with an average mean of 5.13 (*SD* = 1.583) representing a slight feeling of personal obligation among the average research subject. Out of the total amount of research subjects, 25.7% felt a strong personal obligation to protect the marine environment. Descriptives in Table 20 seem to indicate a positive linear relationship, albeit minimally, between someone's personal norm to protect the marine environment and a) the older one is, b) a higher formal level of education, and c) the more whale watch experience one has.

Table 20: Inferential statistics "Personal Norm"

		Mean	St. Dev.	*n*	*t*(df), or F	*p*	Effect size
Gender	Female	5.19	1.553	648	*t*(1052)= -1.670	.095	.11
	Male	5.02	1.615	406			
Age*	Teenagers	4.76	1.483	121	F = 5.265	.001	.133
	Young adults	4.93	1.494	259			
	Middle aged adults	5.27	1.576	446			
	Older adults	5.33	1.814	61			
Education**	High school	4.82	1.557	217	F = 6.918	.001	.118
	College	5.08	1.647	421			
	Graduate school/University	5.33	1.502	350			
Experience*	First time	5.02	1.540	499	F = 2.537	.039	.098
	Second time	5.06	1.646	241			
	Third time	5.13	1.643	97			
	Three to 10 times before	5.41	1.519	185			
	More than 10 times before	5.46	1.757	37			

* significant at the < 0.05 level
** significant at the 0.01 level

A one-way ANOVA found a significant difference in the average personal norm of teenagers in this study, who felt less of a personal obligation to protect the marine environment than the average personal norm of middle aged and older adults. The average personal norm between young adults and middle aged adults also differed significantly (see Appendix L). Another significant difference was found between those whale watchers whose highest level of formal education was graduate school/university and those who finished their formal education after college and high school, who both felt less obliged to protect the marine environment (see Appendix M). Significant differences were observed between a higher personal norm of those research subjects who had been whale watching three to ten times before and those who went whale watching for the first and second time (see Appendix N).

4.2.5.2 Conclusion

Out of 1059 whale watchers, 914 felt a personal obligation to protect the marine environment before their trip started whereas 145 did not feel this personal obligation (see Table 21). Data showed that older individuals felt stronger personal obligations towards the marine

environment. It can therefore be stated that age seems to play an important role in forming a personal obligation to protect the marine environment. A higher level of education and more whale watch experience also seemed to have influence on strengthening an individual's personal obligation to protect the marine environment.

Table 21: Overview "Personal Norm" before whale watch tour

	Frequency	Percentage
Felt a personal obligation to protect the marine environment	914	86.3
Did not feel a personal obligation to protect the marine environment	145	13.7
Total	1059	100

4.2.6 Behavioral Intentions

4.2.6.1 Skill Analysis

The three items that were meant to jointly account for the concept of Behavioral Intentions shared an average correlation among each other of .543, with α=.783. Removing the item that measured the willingness to change ones behavior if that was required to protect the marine environment would increase the inter-item reliability (α=.827, see Appendix D). However, removing this item would mean only two items would remain of which none would touch upon the idea of a behavioral change, a necessary aspect of supporting marine conservation. For that reason, it was decided to keep all three items for further analysis.

4.2.6.2 Descriptives

Whale watchers, on average, only slightly agreed to take action to support the marine environment by either contributing money and/or changing ones behavior, before the whale watch tour began. As seen in Table 22 participants were not overly willing to contribute their money or pay an additional fee above the ticket price of their whale watch tour to support marine conservation. However, on average, one did moderately agree with the willingness to change one's personal behavior to protect the marine environment if required.

Table 22: Descriptives statements "Behavioral Intentions"

	Mean	St. Dev.	*n*
I am willing to change my behavior if this is required to protect the marine environment	5.54	1.453	1060
I would contribute money to support marine conservation	4.45	1.628	1037
I am willing to pay an additional fee above the ticket price of my whale watch tour to support marine conservation	4.30	1.884	677
Average level of behavioral intention to support marine conservation	4.88	1.386	1069

Cell entries are means on a 7-point scale of 1 "strongly disagree" to 7 "strongly agree"

Table 23 shows that middle aged adults were significantly more agreeable to supporting marine conservation than teenagers and young adults (see Appendix O). Although all three means can be associated with a slight willingness to support marine conservation, significant differences were observed between those research subjects whose highest level of formal education was graduate school/university and those associated with high school and college, with the latter

two sharing less of an intention to support marine conservation than those who studied at graduate school/university (see Appendix P). Similar findings were made with regard to one's personal norm, where those individuals who have been whale watching three to ten times before were more willing to support marine conservation as compared to those who went whale watching for the first and second time (see Appendix Q). Effect sizes (η = .098 to .114) were minimal.

Table 23: Inferential statistics "Behavioral Intentions"

		Mean	St. Dev.	*n*	*t*(df), or F	*p*	Effect size
Gender	Female	4.93	1.407	653	*t*(1062) = -1.484	.138	.09
	Male	4.81	1.338	411			
Age*	Teenagers	4.72	1.268	121	F = 3.403	.017	.106
	Young adults	4.70	1.303	262			
	Middle aged adults	5.01	1.387	450			
	Older adults	4.84	1.491	62			
Education*	High school	4.71	1.409	218	F = 4.853	.008	.098
	College	4.80	1.422	424			
	Graduate school/University	5.04	1.293	353			
Experience*	First time	4.80	1.329	501	F = 3.511	.007	.114
	Second time	4.75	1.548	246			
	Third time	5.01	1.329	97			
	Three to 10 times before	5.16	1.277	187			
	More than 10 times before	5.17	1.479	38			

* significant at the < 0.05 level

4.2.6.3 Conclusion

Out of the 1069 individual research subjects that were measured on their intentions, 82.6% intended to support marine conservation (see Table 24), whether through monetary or behavioral means. In-depth analysis showed that middle aged adults were significantly more willing to support marine conservation than teenagers and young adults. Individuals who completed their levels of formal education at the high school and/or college level were less likely to support marine conservation than those who completed graduate school/university level. A final significant difference was observed between whale watchers who were going for their first and/or second time and those who have experienced three to ten whale watches prior to the one used in this study.

Table 24: Overview "Behavioral Intentions" before whale watch tour

	Frequency	Percentage
Willing to support marine conservation	883	82.6
Not willing to support marine conservation	186	17.4
Total	1059	100

4.2.7 Perceived knowledge on supporting marine mammal conservation

4.2.7.1 Descriptives

Whale watchers in this study responded neutrally when asked if they knew how to help support marine mammal conservation (*M* = 4.01, *SD* = 1.738). About a third of the research subjects (36.1%) indicated they did not know how to support marine mammal conservation, where another third of the sample (34.2%) perceived themselves to be slightly to strongly knowledgeable on how to help support marine mammal conservation. Descriptive statistics in Table 25 show a positive linear relationship between one having a higher perceived level of knowledge of how to support marine mammal conservation and whale watching experience, yet the strength of the relationship is to be considered minimal. Significant differences were predominantly found between those who had not experienced whale watching before and those who had been whale watching more than three times. Another significant difference was found between those who went whale watching for their second time and those who have experienced more than ten whale watches (see Appendix R).

Table 25: Inferential statistics "perceived knowledge of marine mammal conservation"

		Mean	St. Dev.	*n*	*t*(df), or F	*p*	Effect size
Gender	Female	4.03	1.790	603	*t*(1000) = -.416	.678	.03
	Male	3.98	1.650	399			
Age	Teenagers	3.91	1.647	112	F = .180	.910	.025
	Young adults	3.86	1.665	252			
	Middle aged adults	3.95	1.770	420			
	Older adults	4.00	1.918	57			
Education	High school	3.74	1.774	196	F =2.909	.055	.079
	College	3.96	1.737	406			
	Graduate school/University	4.11	1.683	334			
Experience*	First time	3.82	1.694	473	F = 5.079	<.001	.141
	Second time	3.97	1.805	232			
	Third time	4.26	1.739	90			
	Three to 10 times before	4.30	1.704	174			
	More than 10 times before	4.83	1.636	35			

* significant at the < 0.01 level

4.2.7.2 Conclusion

Table 26 shows that most whale watchers did not know how to support marine mammal conservation before a whale watch tour. This goes hand in hand with the amount of whale watchers who were on their first trip, while the perception of knowledge on how to support marine mammal conservation increased with whale watch experience. Whale watchers whose highest level of formal education was graduate school/university showed a higher perception of knowledge than individuals whose highest level was high school.

Table 26: Overview “perceived knowledge" to support marine mammal conservation before whale watch tour

	Frequency	Percentage
Perceived to have the knowledge to support marine mammal conservation	343	34.2
Perceived to have a neutral stand	299	29.8
Perceived to not have the knowledge to support marine mammal conservation	362	36
Total	1004	100

4.3 Analysis of conceptual framework

This chapter will examine the relations between the various concepts that make up the adapted VBN-model. Linear regression analyses were executed to test whether the adapted version of the VBN-model from Stern et al. (1999) reflects relationships between the concepts in the context of whale watching. The conceptual framework predicted that participation on a whale watch tour increased awareness of ocean vulnerability which would lead to, a) an increase in awareness of consequences of human induced actions on the marine environment, causing b) a higher ascription of responsibility of one’s’ own individual actions on the marine environment followed by c) a higher personal norm to protect the marine environment which would lead to d) positively influence the behavioral intention to support marine conservation. As the relationship in this analysis was based on continuous variables, correlation was measured using the Pearson correlation coefficient (*r*). In sum, it appears that the adapted VBN-model of Stern (1999) works quite well when applied to the context of whale watching, with significant, and mostly substantial relationships to be found (see Figure 5).

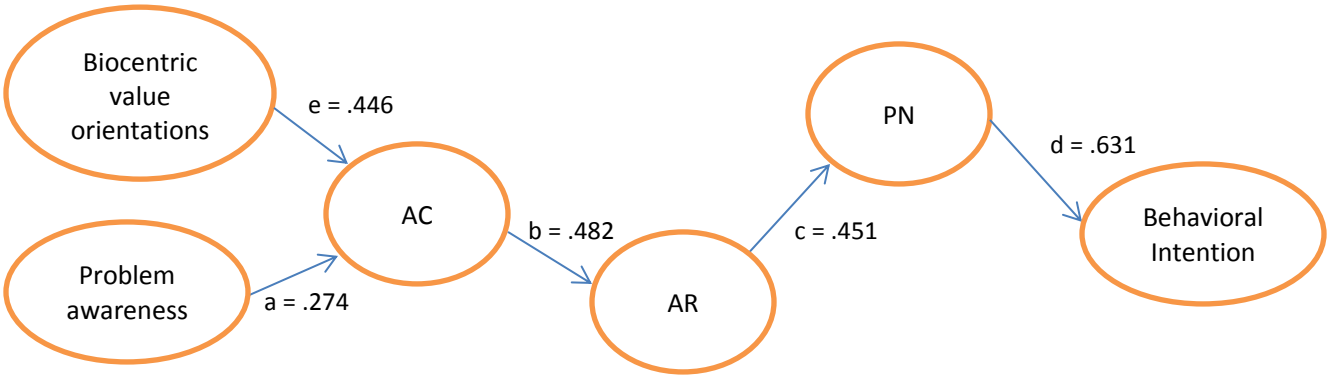

Figure 5: Predictive validity within conceptual framework (AC = Awareness of consequences, AR = Ascription of

Table 27 (see below) presents results of regression analysis from the estimated VBN-model of a personal norm to the behavioral intention towards supporting marine conservation. As theorized by the cognitive hierarchy, a substantial predictive relationship does exist between someone’s personal norm to protect the marine environment and one’s behavioral intention to support marine conservation. Personal norm is predicted by the same kinds of variables that are anticipated in Schwarz’s Norm Activation Model (Schwartz, 1977), namely ascription of responsibility and awareness of consequences. Ascription of responsibility towards the marine environment also seems to be effected by awareness of adverse consequences on the marine environment, which was predicted by H3. But when the antecedents of awareness of

consequences are analyzed, one prediction of the adapted VBN-model does not hold as much as anticipated. Problem awareness seems to have a weak relationship with predicting one's awareness of consequences, in which only 7.5% of the variance is explained. Awareness of consequences does seem to originate from biocentric value orientations, as postulated by the actual VBN-model (Stern, 1999), with a substantial correlation and explaining 19.9% of the variance in respondents' awareness of consequences.

Table 27: Average correlations among variables in adapted VBN-model

Dependent variables → Independent variables ↓	Problem awareness	AC	AR	PN	BI
Biocentric VO	.240 (5.8%)	.446 (19.9%)	.294 (8.6%)	.346 (12%)	.359 (12.9%)
Anthropocentric VO	.510 (26%)	-.275 (7.6%)	.305 (9.3%)	.218 (4.7%)	.229 (5.3%)
Problem awareness	—	.274 (7.5%)	.216 (4.7%)	.151 (2.3%)	.169 (2.9%)
AC		—	.482 (23.3%)	.465 (21.6%)	.469 (22.0%)
AR			—	.451 (20.4%)	.436 (19%)
PN				—	.631 (39.8%)

What is interesting to note is the strong predictive validity that AC has with PN (*r* = 4.65, 21.6% explained), more so than as the predicted AR (.451, 20.4% explained). To control for the combined influence of respondent's "awareness of consequences to the marine environment" and their "ascribed feeling of responsibility" on someone's "personal obligation to protect the marine environment," a multiple regression analysis was performed to test whether the combined influence of AC and AR had a stronger relationship with PN than AC alone. The addition of AC to AR did result in a stronger explanatory power towards PN (R = .532), hereby explaining 28.3 % of the variance in PN (see Appendix S). This is in accordance with Schwartz´s Norm-Activation Model (Schwartz, 1977), which offers a comprehensive approach of how "behavior is a function of both people´s (a) assignment of responsibility for their actions and (b) understanding that their actions might have consequences for the welfare of others" (Milfont et al., 2010, p. 1). It is therefore suggested that Schwartz´s Norm-Activation Model presents a more accurate tool for further investigations.

Regression analysis also proved that anthropocentric value orientations catered for a weaker predictive validity towards awareness of consequences. It can therefore be suggested that individuals who hold beliefs that the marine environment should be protected are more likely to be aware of the consequences their individual actions have. This would confirm the fifth research hypothesis. Note that, even though anthropocentric value orientations appeared to have quite a substantial relationship with problem perception (r = .510, explaining 26% of the variance), this viewpoint was excluded from the conceptual framework, indicating that the frequently reported positive relation between biocentric viewpoints and environmental

awareness of consequences was the point for investigation, as was done in previous research (e.g. Christensen, 2007).

4.4 Impact of a whale watch tour

Out of the statistical population of 1087 whale watchers who completed the pre-trip survey, a total subset of 550 (51%) individuals completed both the pre-trip questionnaire as well as the post-trip questionnaire. As several research questions were based on differences on one variable between two paired samples, where the values for each sample were collected from the same individuals, the appropriate test statistic to be used was a one-paired sample *t*-test. Data of the research subjects were transferred into SPSS and one-paired sample *t*-tests were executed between the pre-trip questionnaires and the post-trip questionnaires to compute the differences of the individually matched pairs, hereby examining if the effect of a whale watch tour is discernible from zero (no effect). As only matched pairs can be used to perform a one-paired sample *t*-test, there were also some minor differences in the population sizes (*n*) among several concepts measured, whereby cases were excluded analysis by analysis (with a significance level of .095, α = .05). In order for a stronger power analysis, the strength of the association between the several concepts and the independent demographic variables (the effect size), was calculated using Cohen's *d*.

4.4.1 Problem Awareness

4.4.1.1 Descriptives

Due to the large percentage or participants already believing that the ocean is in a vulnerable state, it is not surprising to see only a small positive change towards a higher level of awareness of the ocean's vulnerability. That said, out of the three statements used for this concept, two significant changes in the average mean were observed among those whale watchers who filled in both the pre- and post-trip survey (see Table 28).

Table 28: Changes in items "Awareness of Oceans' Vulnerability"

	Mean change	St. Dev.	*n*	*t*	*p*	Effect size (*d*)
Polluted oceans are able to clean themselves**	-.206	1.233	545	-3.891	<.001	.17
Oceans are so large, it is unlikely that human will cause any lasting damage to them*	-.186	1.291	548	-3.376	.001	.14
We do not need to worry about the oceans' health because we will develop new technologies to keep them clean	-.062	1.262	546	-1.153	.249	.05

* significant at the 0.01 level
** significant at the < 0.01 level

A statistically significant increase in the awareness of ocean vulnerability was observed in people believing more strongly that polluted oceans are not able to clean themselves. A significant mean difference was also observed between pre-trip and post-trip results of the belief that "oceans are so large, it is unlikely that human will cause any lasting damage to

them," with whale watchers showing more awareness here as well. Both Cohen's *d* statistics indicated a minimal effect size. No significant change was observed between people believing that the oceans' health is nothing to worry about as new technologies will be developed to keep oceans clean before the trip and after the trip. This correlation supports the idea that there is a negative linear relationship between average change in one becoming aware of the vulnerability of the ocean and an anthropocentric viewpoint (r = -.187, p = <.001).

4.4.1.2 Conclusion

The first research hypothesis predicted a positive association between participation in a whale watch tour and a gained level of understanding of the ocean vulnerability. While whale watchers in this study indicated to already be moderately aware of this, post-trip results support Hypothesis 1 as significant positive changes were observed in two out of the three items that measured awareness of the ocean's vulnerability. Of those whale watchers that indicated they were unaware of the ocean's vulnerability before their tour, 3.3% became aware (see Table 29), while 1.3% of this group became less aware. No change was found in the majority (95.4%).

Table 29: Amount of whale watchers changing problem awareness

	Frequency	Percentage
Became more aware after their whale watch tour	18	3.3
Did not change their level of awareness after their whale watch tour	525	95.4
Became less aware after their whale watch tour	7	1.3
Total	550	100

4.4.2 Awareness of Consequences

4.4.2.2 Descriptives

Post-trip results (see Table 30) showed a decline in all four items that measured awareness of consequence, with the least decline in the awareness of consequences towards marine mammals, specifically, as compared to the marine environment. Data in this study would therefore suggest that the second hypothesis, which stated that an increase of awareness in the oceans' vulnerability was expected to increase whale watchers' levels of awareness of consequences on the marine environment, cannot be confirmed.

Table 30: Changes in items "Awareness of Consequences"

	Mean change	St. Dev.	*n*	*t*	*p*	Effect size (*d*)
I am worried about the health of the marine environment*	-.190	1.705	517	-2.528	.012	.11
Cleaning products that I use in my house on a daily basis can have a negative effect on the marine environment	-.078	1.650	281	-.795	.427	.05
The loss of marine mammals can have a negative effect on the health of human beings	-.021	1.701	536	-.279	.780	.01
A lot of species of marine life will become extinct within the next few decades	-.012	1.404	256	-.134	.894	.008

* significant at the < 0.05 level

Table 30 shows that whale watchers became less worried about the health of the marine environment, with this item showing the biggest and only significant difference in pre-trip and post-trip results and had a minimal effect size. As this was an unexpected result, more in-depth analysis might provide enlightenment. An independent *t*-test and One-Way ANOVA were used to analyze if one becoming less aware of consequences after a whale watch tour can be attributed to demographic variables and/or whale watch experience. Table 31 shows these results, in which several observations are noteworthy.

Table 31: Inferential statistics "Change in awareness of consequences"

		Mean change	St. Dev.	*n*	*t*(df), F or *r*	*p*	Effect size
Gender*	Female	-.001	1.360	347	*t*(524) = -3.094	.002	.30
	Male	-.3558	1.166	200			
Age	Teenagers	-.022	1.219	45	F = 1.124	.339	.087
	Young adults	-.097	1.052	133			
	Middle aged adults	-.237	1.420	255			
	Older adults	.1288	1.181	33			
Education	High school	-.1321	1.219	94	F = 1.353	.259	.073
	College	-.0746	1.206	209			
	Graduate school/University	-.2705	1.267	207			
Experience	First time	-.0877	1.401	250	F = 1.387	.237	.101
	Second time	-.2948	1.296	145			
	Third time	-.0674	.9176	47			
	Three to 10 times before	-.0463	1.092	90			
	More than 10 times before	-.4844	1.674	16			

* significant at the <0.05 level

First of all, it turned out that females in this sample did not change their awareness of consequences after their whale watch tour, which made a significant difference compared to males. The effect size indicates a somewhat minimal, leaning to typical relationship. The other remarkable data that Table 31 provides is that older adults are the only subgroup of the research subjects who became more aware of consequences on the marine environment. Additionally, whale watchers who had been on more than ten whale watching trips showed on average, decrease in their awareness of consequences.

4.4.2.2 Conclusion

With a negative change in all means, it is to be expected that, in absolute numbers, more research subjects will be less aware of adverse consequences on the marine environment. Table 32 illustrates that 6% of 548 whale watchers became less aware of adverse consequences than before their tour, with 4.6% becoming more aware. An independent t-test also revealed an interesting and significant difference in the overall change based on gender differences, with an observable mean change notable among male respondents (-.3558) whereas no observable change was witnessed among female respondents (-.001). Another point to note is that older adults were the only group that indicated an increase in the awareness of consequences.

Table 32: Amount of whale watchers changing awareness of consequences

	Frequency	Percentage
Became more aware of consequences after their whale watch tour	25	4.6
No change in level of awareness of consequences after their whale watch tour	490	89.4
Became less aware of consequences after their whale watch tour	33	6.0
Total	548	100

4.4.3 Ascription of Responsibility

4.4.3.1 Descriptives

Upon the return trip, data of those research subjects who took both the pre-trip as the post-trip survey shows that all items that measured one's ascription of responsibility were positively changed by a whale watch tour (see Table 33).

Table 33: Changes in items "Ascription of Responsibility"

	Mean change	St. Dev.	*n*	*t*	*p*	Effect size (*d*)
I believe the government has the task to protect the marine environment, not me**	.276	1.747	508	3.555	<.001	.16
I feel at least co-responsible for threats to marine mammals*	.225	1.652	276	2.260	.025	.14
My contribution to pollution into the marine environment is negligible*	.180	1.763	495	2.269	.024	.10
I am jointly responsible for threats to the marine environment	.138	1.648	509	1.882	.060	.08

* significant at the <0.05 level
** significant at the < 0.01 level

The whale watchers in this study showed the most positive change in responsibility towards believing that protection of the marine environment does not rely solely on the government. On average, there was also a significant change found in those whale watchers who felt more co-responsible for threats to marine mammals after having witnessed them on their tour. One also felt significantly more responsible after a whale watch tour when it comes to the belief that one's personal contribution to polluting the marine environment is not as minimal as one thought before their tour had started. All three differences showed to be of little practical

significance due to a minimal effect size. And although post-trip results revealed a positive change among whale watchers feeling more joint responsibility for threats to the marine environment after their whale watch tour than before, it did not produces a large enough effect to speak of a significant change.

4.4.3.2 Conclusion

Overall, a whale watch tour in this study strengthened the ascribed feelings of responsibility in 8.1% out of 546 whale watchers who completed both surveys (see Table 34). This supports the idea that a whale watch tour did change ones ascribed feeling of responsibility. Cross tabulation (see Appendix T) also shows that half of the respondents who became more aware of consequences of their actions on the marine environment after a whale watch tour also felt more responsible for the marine environment after a whale watch tour. This supports H3: People with a higher awareness of consequences will share a higher ascription of responsibility.

Table 34: Amount of whale watchers changing ascribed feeling of responsibility

	Frequency	Percentage
Felt more ascribed responsibility after their whale watch tour	44	8.1
No change in level of awareness of consequences after their whale watch tour	485	88.8
Felt less ascribed responsibility after their whale watch tour	17	3.1
Total	546	100

4.4.4 Personal Norm

A significant change in one's personal norm to protect the marine environment was found as a result of having experienced a whale watch tour (see Table 35). The effect size indicated a minimal relationship.

Table 35: Change in "Personal Norm"

	Mean change	St. Dev	*n*	*t*	*p*	Effect size (*d*)
* I feel a personal obligation to protect the marine environment	.275	1.397	539	4.565	<.001*	.20

* significant at the < 0.01 level

In terms of absolute numbers of whale watchers changing their feeling of personal norm towards protecting the marine environment, Table 36 reveals that 15% of whale watchers developed a sense of personal obligation to protect the marine environment after the tour, of which 28 of these 81 felt no personally obligation to protect the marine environment before their tour (taking the cut-off point of 3.5 into account). The majority (73.5%) did not change their feeling of personal obligation, with another 8% feeling less obliged after their tour.

Table 36: Amount of whale watchers changing personal norm

	Frequency	Percentage
Felt a stronger personal obligation after the tour while not having felt personally obliged to protect the marine environment before the tour	28	5.2
Felt a personal obligation after the tour while feeling neutral before the tour	53	9.8
Felt neutral after having felt no personal obligation before the tour	19	3.5
Did not change their level of personal norm to protecting the marine environment	396	73.5
Felt less of a personal norm, albeit still having one	34	6.3
Felt a personal norm before the tour but did not feel personal norm after the tour	9	1.7
Total	539	100

4.4.5 Behavioral Intentions

4.4.5.1 Descriptives

Strong significant changes were found in the behavioral intentions of whale watchers to support marine conservation after they had experienced a whale watch tour (see Table 37). While the average willingness to pay an additional fee above their ticket price to support marine conservation was neutral before the tour, this increased to a slight agreement after the trip. This was accompanied with a typical strength of association. The effect sizes for the other two significant changes in pre-trip and post-trip results were deemed minimal.

Table 37: Changes in items "Behavioral Intentions"

	Mean change	St. Dev	*n*	*t*	*p*	Effect size (*d*)
I am willing to pay an additional fee above the ticket price of my whale watch tour to support marine conservation*	.587	1.410	252	6.612	<.001	.42
I am willing to change my behavior if this is required to protect the marine environment*	.317	1.217	536	6.035	<.001	.26
I would contribute money to support marine conservation*	.249	1.213	518	4.672	<.001	.21

* significant at the < 0.01 level

4.4.5.2 Conclusion

Table 38 below provides an overview of the overall change in the behavioral intentions among those whale watchers who completed both surveys. Although the majority of participants did not change their willingness to support marine conservation after having experienced whale watching, 7.4% of 546 whale watchers directly increased their willingness to support marine conservation after the trip.

Table 38: Amount of whale watchers changing behavioral intentions

	Frequency	Percentage
Felt more willing to support marine conservation after the trip	40	7.4
Willingness to support marine conservation did not change	486	89.3
Felt less willing to support marine conservation after the trip	18	3.3
Total	546	100

4.4.6 Knowledge on supporting marine conservation

An average change in the mean of .739 was perceived after 505 whale watchers experienced their whale watch tour (see Table 39). This turned out to be significant with an effect size that typifies a somewhat typical relationship.

Table 39: Change in "Perceived knowledge to support marine mammal conservation"

	Mean change	St. Dev	*n*	*t*	*p*	Effect size (*d*)
I feel knowledgeable about how to support marine mammal conservation*	.739	1.907	505	8.702	<.001	.39

* significant at the < 0.01 level

In absolute terms, this change can be translated to 160 out of 505 whale watchers who perceived to have become more knowledgeable after a whale watch tour. Half of this group didn't perceive to have any knowledge about how to support marine conservation before their tour, whereas the other half felt neutral towards knowing how to support marine conservation (see Table 40). A total of sixty other whale watchers indicated to have gained a lower level of knowledge on this topic after their tour, with fourteen of them having changed completely as they shared the perception to have this knowledge before their tour but indicated to not knowing how to support marine mammal conservation after the tour.

Table 40: Amount of whale watchers changing perceived knowledge towards supporting marine mammal conservation

	Frequency	Percentage
Became knowledgeable after not having the knowledge before the trip	80	15.8
Turned from neutral to knowledgeable after a tour	80	15.8
Became neutral after whale watch tour while not having knowledge before	40	7.9
Did not change their level of perceived knowledge to support marine mammal conservation	245	48.6
Became less knowledgeable	46	9.1
Did not believe to have the knowledge after their whale watch tour while perceived to have this knowledge before their tour	14	2.8
Total	505	100

4.5 Longer-term changes

A total of 426 out of the 1087 research subjects (39%) left their contact details for the longer term follow-up questionnaire. This resulted in a response rate of 23% of those who left their e-mail addresses, leaving a total response rate of the entire sample at just 8.9%.

4.5.1 Awareness of Consequences

Taking the results from the post-trip into perspective, in which awareness of consequences decreased right after a whale watch tour, Table 41 shows the mean change in the items that measured the awareness of consequence levels from respondents two to three months after they had experienced their whale watch. This provides an entirely different outcome. A close look at the mean changes and significance levels indicate a higher level of awareness of

consequences two to three months later, with two significant changes in one worrying more about the health of the marine environment one to three months after one's whale watch experience as well as to the belief that cleaning products that respondents use in their house can negatively affect the marine environment. On average, the belief that the loss of marine mammals can have a negative effect on the health of human beings did not change.

Table 41: Longer-term changes in awareness of consequences

	Mean change post-tour (post-trip)	St. Dev.	*n*	*t*	*p*	Effect size (*d*)
I am worried about the health of the marine environment*	.457 (-.190)	1.448	93	3.024	.003	.32
Cleaning products that I use in my house on a daily basis can have a negative effect on the marine environment*	.433 (-.078)	1.370	60	2.450	.017	.32
A lot of species of marine life will become extinct within the next few decades	.158 (-.012)	1.214	95	1.267	.208	.008
The loss of marine mammals can have a negative effect on the health of human beings	.001 (-.021)	1.926	63	.000	.999	.13

* significant at the <0.05 level

4.5.2 Behavioral intentions

One's behavioral intention to support marine conservation and what one would be willing to do remained consistent with responses given at the completion of the whale watch tour (see Table 42). However, in the long term, one was more willing to pay an additional fee in the price of their next whale watch tour if that supports marine conservation (.721) than right after having experienced a whale watch tour (.587). In contrast, one felt more enticed to change their behavior to protect the marine environment straight after having experienced a whale watch tour (.317) than three months later (.250). The effect size indicated a typical relationship.

Table 42: Longer-term changes in behavioral intentions

	Mean change post-tour (post-trip)	St. Dev.	*n*	*t*	*p*	Effect size (*d*)
I am willing to pay an additional fee above the ticket price of my whale watch tour to support marine conservation*	.721 (.587)	1.572	61	3.584	.001	.46
I am willing to change my behavior if this is required to protect the marine environment	.250 (.317)	1.298	96	1.887	.062	.19
I would contribute money to support marine conservation	-.033 (.249)	1.792	91	-.176	.861	.02

* significant at the 0.01 level

4.5.3 Actions to support marine conservation

Respondents were also asked if they believed they had engaged in a specific action to help the marine environment. Typical answers given (n = 54) were that they recycled, tried to conserve water and energy, reduced waste, used eco-friendly cleaning products, and did not use chemicals/fertilizer on their lawns and gardens to avoid any runoff into the ground water. Eight in ten indicated to have been doing this before their whale watch experience, whereas two out of ten respondents pointed out that they have become more involved in their actions to protect the marine environment after their whale watch experience.

5. DISCUSSION

The overall objective of this study was to determine if a whale watch tour, as an educational tool, enhanced people's understanding of and awareness of consequences on their personal impact towards protection of the marine environment and the effectiveness of the Whale SENSE program. The findings have implications for further research and practical management issues. The main guiding research question in this study asked to what extent a whale watch tour increases the awareness of the consequences regarding people's impact on the marine environment. Post-trip results showed that a whale watch tour in New England made whale watchers, on average, less aware of adverse consequences on the marine environment than before they had experienced a whale watch tour. Respondents' overall awareness of consequence declined after a whale watch tour in all four factors that measured this concept, with whale watchers being significantly less worried about the health of the marine environment after their whale watch tour. Post-tour results two to three months after a whale watch tour showed positive signs, with indications of a higher level of awareness of consequences among these respondents. However, if a whale watch tour is there to promote marine conservation, then it is disturbing if it fails in creating awareness. This brings up an interesting discussion point as to why awareness of consequences decreased after a whale watch tour.

5.1 Awareness of Consequences

Looking back at the theory, for one to be aware of how their own actions can hurt the environment, one needs a) to have a level of awareness that the oceans are vulnerable, and b) biocentric beliefs about the environment, which should predict awareness of consequences of engaging in environmentally responsible behaviors (Stern et al., 1999). In her study into the relationship between value orientations and awareness of consequences related to whales and the marine environment in Oregon, Christensen (2007) reported that, although value orientations were substantially related to awareness of consequences, a large portion of variance in awareness of consequences remained unexplained. In this study, awareness that the oceans are vulnerable was another determinant hypothesized to influence awareness of consequences. This was rationalized by the idea that once whale watchers are aware that the marine environment is susceptible to human induced activities, they would become aware of their impact on the marine environment. However, problem awareness seems to have a weak relationship with predicting ones awareness of consequences.

Regression analysis showed that this level of awareness did justify one's awareness of consequences, albeit minimal ($r = .274$) and explained only 7.5% of the variance. Data also showed that a large majority (92.2%) of those surveyed were aware of the vulnerability of the health of the oceans before they experienced their whale watch tour. Yet, a study that was conducted by the American Association for the Advancement of Science in 2004 (as cited in WDCS, n.d.) showed that only 31% of the general public surveyed understood that their personal choices had impacts on the health of the oceans. This difference is not surprising, as Lee and Moscardo (2005) noted that tourists who are involved in the realm of

ecotourism/nature-based tourism are mainly consumers who are environmentally aware. Another idea as to why this difference is notable might be due to the fact that many environmental disasters have occurred in the past six years that received a lot of media coverage, e.g. the oil spill in the Gulf of Mexico in April, 2010, radiation leaks from the nuclear power plant in Japan 2011. Although a moderate level of awareness was discovered before a tour, it can therefore also be suggested that knowing that someone is aware of the ocean's vulnerability is not a strong predictor for knowing someone's level of awareness of consequences.

This study shows that biocentric value orientations towards the marine environment proved to be a far better predictor for knowing someone's awareness of consequences. This is in accordance with the VBN-model (Stern et al., 1999) that proposes someone's awareness of consequences originates from someone's values. In other words, when a person believes the marine environment is important and should be protected, it is likely that this person is more aware of the consequences of his or her behavior. Data in this study fully supports this as respondents with biocentric value orientation seemed to have the best fit towards a predictive accuracy of someone's awareness of consequences. This also confirms the fifth research hypothesis, which states whale watchers with biocentric value orientations are likely to be aware of the consequences of their behavior on the marine environment. With a substantial correlation of .446 and explaining 19.9% of the variance in respondents' awareness of consequences, these findings are consistent with empirical evidence reported by Christensen (2007), who had discovered that a predicted positive relationship existed between value orientations and awareness of consequences of personal actions (r = .49), where biocentric value orientations explained 24% of the variance in respondents' awareness of consequences. However, Christensen et al. (2007) as well as Smith et al. (2009), who were inspired by the former and had conducted similar research in the context of diving with grey nurse sharks in Australia, did not operationalize the dimensions of the wildlife value orientations in full validity as both used different forms of specificity, e.g. measuring the protectionist value orientation towards both the marine environment (more general) as well as to whales and sharks (very specific). However, the findings in this study still do not explain the reason why whale watchers became less aware of consequences after their whale watch tour.

One educated guess as to why awareness of consequences decreased has to do with the level of expectation. This became clear through many conversations the author had with whale watchers (including research subjects) during the boat trip to Stellwagen Bank. The general consensus was that the majority of whale watchers expected to encounter a few whales in the distance. This was either based on a lack of knowledge about whale watching in Stellwagen Bank and/or on reflecting back on previous experiences in other areas. For example, those that indicated they had seen whales in Alaska saw a few whales (up to five) at distance, which was regarded by them as "normal." According to Orams (2000), the proximity of the boat to the whales does not appear to be an important influence on whale watchers' satisfaction. However, some trips during this study encountered close to thirty whales per trip with some animals swimming in close proximity to, or intentionally approaching the whale watch boats. Not measuring a whale watcher's expectation level before their tour started can therefore be

seen as a major shortcoming for this study in identifying a valid reasoning behind an overall decline in awareness of consequences. With a whale watch tour having potentially exceeded expectation levels with regards to both amount of whales and proximity to the whales, this could partly explain why whale watchers became less concerned after the trip. It is possible that seeing many whales made participants less likely to believe that are endangered or in need of protection. After all, they have suggestively encountered more whales than they expected and might therefore reason that the hardship whales are facing is not as severe as conservation organizations portray. Getting to know where whale watchers encountered whales prior to their tour in New England might also provide more suggestions as to why the most experienced whale watchers, those who have been on more than ten trips, showed the biggest decline in their awareness of consequences. Half of this group consisted of middle aged adults who reported a high level of awareness of consequences before their tour. This reinforces that previous experience is an indicator of both the amount, and the type, of information one might have received in previous situations is relevant.

Previous experience has the ability to influence how an individual understands information and interpret a current experience (Schreyer et al., 1984, as cited in Christensen, 2007). This information is critical in understanding the influence of the Whale SENSE program. Whale SENSE has only been recently introduced to commercial companies in the Northeast Region. A major component of the program is to ensure that naturalists discuss, not only the threats whales face (e.g. ship strikes, fishing gear entanglements) but also present the passengers with information on mitigation (e.g. moving the shipping lanes, using sinking ground lines). The intent was to reduce ecophobia (Sobel, 1995) and keep passengers hopeful regarding the future of whales and the marine environment. However, it is possible that whale watchers, particularly well-experienced, received a lot of information on previous trips that touched upon levels of awareness of consequences, but these previous trips may have failed to provide information about certain mitigation measures that are in place. Suddenly hearing about solutions to the hardship that whales face every day might result in whale watchers becoming less worried about the marine environment and marine mammals after their tour as they might perceive that the issues are being dealt with already by specialists. In turn the whale watchers might believe that they do not have to worry about it anymore. A simple solution to address this problem might be to explain to whale watchers that the mitigation measures may reduce, but not eliminate a threat, or emphasize that the activities in the waters off New England are extraordinary and aimed at saving the critically endangered North Atlantic right whale from extinction (i.e. these measures do not apply to whales species, or whales in all oceans who face similar threats). However, this alone might seem too simplistic when taking another finding into account.

Another guess as to why awareness of consequences declined after a tour is related to value orientations and how conservation messages are communicated through value orientations. This study measured the biocentric value orientation, which is measured as a concern for nonhuman species and the natural environment, mirrored to what a whale watch tour touches upon during its interpretation. However, it is important to recognize that every individual also has an egoistic orientation, which is concerned with one feeling personally threatened by

environmental issues or hazards (Stern et al., 1993). This egoistic orientation has proven to be the strongest orientation towards environmental concern (Stern et al., 1993). Concern for oneself was not addressed on any tour as the focus was on adverse consequences on and concern for the marine environment and marine mammals. It is therefore possible that these consequences were not deemed personally relevant for the whale watchers. Making connections to adverse consequences to oneself could potentially make whale watchers aware of consequences to the marine environment. This could cause a feeling of personal responsibility which, in turn, could influence support of marine conservation.

An independent t-test revealed a significant difference in the overall change based on gender differences, with women barely showing a change in their levels of awareness while men seemed to become a lot less aware of consequences. Interestingly, this also came back in a study by Stern et al. (1993), in which women had stronger beliefs than men about consequences for self, others, and the biosphere. Another point to note is that older adults were the only group showed an increase in awareness of consequences. This group is quite interesting for several reasons: 1) Older adults were the least aware of the vulnerability of the oceans before the trip started; 2) Older adults became the most aware of the oceans' vulnerability after their trip; 3) Older adults were the only ones that, on average, showed to an increase in their awareness of consequences after a whale watch tour; 4) Older adults felt the highest ascribed feeling of responsibility; 5) Older adults felt the strongest personal obligation to protect the marine environment. What is most interesting is the idea that older adults felt most responsible towards the marine environment before the tour and were the only group to have become more aware of consequences after a tour. This might lead to the simple assumption that only the whale watchers who felt very responsible before the trip also became more aware of consequences on the marine environment after a whale watch tour.

This is interesting as theoretically, according to the VBN-model, awareness of consequences precedes the variable of ascription of responsibility because "only when someone is aware of harmful consequences does responsibility for those consequences become a moral issue" (Stern et al., 1986, p 210). The finding in this study could disprove the idea that one must first be aware of one's consequences before accepting some responsibility for their actions. Now, one might wonder if a whale watch tour makes someone more responsible or if they first have to be responsible to become aware of consequences once they become aware of the problem. Taking older adults into account seems to suggest that one has to have a strong ascribed feeling of responsibility towards the marine environment before becoming aware of consequences on the marine environment. Overall, although these educated guesses might be correct, the theoretical meaning of these relationships remains unclear. Even though a pre/post method was needed to produce these findings, qualitative research methods might have yielded more in-depth clarifications as to why, on average, whale watchers became less aware of consequences after their whale watch tour.

5.2 Involvement in marine conservation

Environmental education that is focused on the marine environment can provide whale watchers with knowledge that is necessary to be aware of marine conservation issues as well as evaluate the importance of these issues in order for them to make connections. Ultimately this makes the issue personally relevant to the individual and results in the whale watchers aware of personal action consequences on the marine environment. This could cause a feeling of responsibility which could influence behavior to support marine conservation as a whole, not just marine mammals. As whale watching can be regarded as a carefully controlled conservation tool, it is interesting to determine whether whale watchers believe they know how to support marine mammal conservation before, and after, their tour, and whether or not they find it important to learn about marine mammal conservation and become involved in it.

According to Gilbert (1997, as cited in Lück, 2003), ecotourists are interested in learning about the environment of the local area, its culture and wildlife." This can be compared to a study conducted by Lück (2003) in which he concluded that the majority of whale watchers are eager to learn on whale watch tours. This in contrast to this study, where pre-trip data shows that whale watchers did not think it was that important to learn how to become involved in marine mammal conservation. Due to the quantitative approach of this study and a lack of space on the survey to follow-up on this item, future qualitative research might yield information as to why whale watchers indicate they do not want to learn how to get involved in marine (mammal) conservation. It is unclear if respondents in this study were rejecting the idea of learning about how to get involved, if they were not provided adequate information about how to get involved, if there were perceived barriers to their involvement, or if they felt they already had adequate knowledge of how to be involved prior to the tour. Open-ended responses in post-trip results suggest that the general perception of how one can contribute is through donations, whereby several commenters mentioned that they would contribute to marine mammal conservation if they had the money for it. As a result, one must consider the current depressed economic climate and the possibility that the whale watchers believe they are not able to contribute financially at this time. These comments also seem to suggest that whale watchers perceive supporting conservation monetarily is the prime method to contribute. This may indicate that respondents did not recognize the impact that small changes in their lifestyle can also make many positive impacts, even more so than donating money to support marine conservation. Not knowing how to support marine conservation can therefore be regarded as a constraint for whale watchers to live up to their positive intentions. Whale watchers were therefore also assessed on their perceived level of knowledge on how to support marine mammal conservation before and after their tour. Related findings suggest a potential weakness for the method used.

Before their trip, the average respondent indicated they didn't know how to support marine mammal conservation. Yet, upon return, a significant positive change was observed, which leads to suggest that a whale watch tour did make the general public more aware of how to support marine mammal conservation. Close to a third of the research subjects indicated to have gained knowledge on how they can support marine mammal conservation. However, with an onboard naturalist, who received specialized training in whale watching, expanding scientific

and local knowledge towards the whale watchers, it was interesting to observe that one in ten whale watchers perceived to have become less knowledgeable after their tour. As this was an evaluative response in which respondents assessed their own perceived belief, it can be argued that one of the biggest weaknesses of the pre-trip post-trip method may be attributed to a "change in the participant's metric for answering questions from the pre-test to the post-test due to a new understanding of a concept being taught" (Klatt & Taylor-Powell, 2005, as cited in Colosi & Dunifon, 2006). It is possible that respondents thought they knew how to support marine mammal conservation before their trip, but gained sufficient information during the narration which made them realize they were not as knowledgeable about issues as they previously believed. If they had more to learn, they may have become less confident in their perceived knowledge on the post-trip survey. While these data may initially appear to show a negative impact of the knowledge offered onboard, it may actually reflect only an evaluation of their perceived knowledge before their trip. Some whale watchers also commented on the post-trip survey that there was a lack of information on how they, as individuals, can improve ocean quality and advocate for marine life. This may imply that they did increase their awareness of conservation issues, but were not confident that they gained knowledge as to how to personally make a difference.

6. CONCLUSION

This article explored the cognitive changes that may or may not occur in the context of a whale watch tour and focused on whale watchers in southern New England while examining their environmental value orientations, awareness of vulnerability of the oceans, awareness of impacts and corresponding consequences, feelings of ascribed responsibility, personal norm and behavioral intentions. This final chapter will draw conclusions from the findings while elaborating on the problem statement and answering other research questions that were considered. The first subchapter will profile the characteristics of the whale watchers in this study and touches upon demographics, their patterns of belief towards the marine environment, wildlife viewing attitudes, and awareness of the Whale SENSE program. The second chapter will draw conclusions regarding the effectiveness of a whale watch tour in New England. The third part of this chapter will elaborate on the theoretical framework and methods used in this study and will lay out recommendations for future research into the effectiveness of whale watching. The fourth and final subchapter touches upon the practical application of the findings in this study and will bring forward recommendations for management and policy within the whale watching industry.

6.1 Whale watchers characteristics

Out of the 1087 whale watchers in this study, a considerable number of respondents were female (61.4%), who seemed to be significantly more aware of the oceans' vulnerability than males. The average age among the respondents was 39, while almost half of the sample was middle aged adults between 40 and 65 years old. This group was significantly more aware of adverse consequences than teenagers (13 – 19 years of age) and young adults (20 – 40 years) as well as more willing to support marine conservation than the other age groups. Young adults showed a significantly higher level of awareness that the oceans are vulnerable than teenagers, middle-ages adults, and older adults (65 years and older), who showed to be the least aware of the oceans' vulnerability. Older adults also felt the most responsible for the marine environment and the strongest personal obligation to protect the marine environment, which were both significantly stronger than teenagers.

The highest level of formal education completed by the majority of respondents was college (42.8%), followed closely by graduate school/university (35.5) and high school (21.7%). Individuals whose highest level of formal education was graduate school/university showed a higher level of awareness than those who only finished high school and/or college, yet no significant differences were detected. Respondents whose highest level of formal education was graduate school/university were significantly more aware of consequences and shared a significantly stronger intention to support marine conservation than those whose highest level of education was college or high school. The latter group of individuals significantly shared fewer feelings of responsibility towards the marine environment as compared to those who went to college and graduate school/university.

Nine out of ten respondents were from the United States of America, of which one third were local, from the state of Massachusetts. British represented the largest group of those with a

European nationality. Most of the respondents had not experienced a whale watch before (47%). Additionally, almost a quarter (23.2%) indicated they had experienced only one whale watch previously. These individuals showed the least amount of responsibility towards the marine environment before their whale watch experience. Interestingly, the group of individuals who had been whale watching more than ten times showed the least awareness of the vulnerability of the oceans' health. Significant differences were observed in a higher personal norm of those respondents who had been whale watching three to ten times before compared to those who were whale watching for the first and second time.

Respondents, on average, believed that the marine environment should be protected. Although it can be suggested that people who either have a anthropocentric or a biocentric viewpoint both share a positive attitude towards environmental protection, albeit for different reasons, this study showed that the general consensus of protecting the marine environment was due to the marine environment having value, whether humans are present or not. Overall, the majority of whale watchers shared a biocentric viewpoint towards the marine environment. The general belief shared was that protecting the marine environment is important because it has an intrinsic value, which is a reason to protect it rather than using the marine environment primarily for human benefit. Females shared this belief more strongly than males, where males shared a significantly stronger belief in a human centered and utilitarian viewpoint of the marine environment. With an overall protective viewpoint of the marine environment in mind, the welfare of whales was deemed more important for whale watchers before they embarked on their tour than being as close to the whales as possible. More specifically, they deemed it very important for the boat to maintain a safe distance from the whales while knowing that the boat was following whale watching guidelines.

What is striking to see is that more than half of the well-experienced whale watchers who had participated in more than ten whale watch trips found it more important to be close to whales than those individuals that were going on their first trip. However, it was not determined where they had whale watched previously. Apart from this, it was notable to conclude that one out of ten of the well experienced whale watchers don't attach any importance for a whale watch boat to maintain a safe distance from the whales. Seeing other wildlife, e.g. seals and birds was also considered to be important. On average, all four items that touched upon the importance of learning something on a whale watch tour, were regarded of importance, albeit less important than the proximity of whales or seeing non-whale species**.** Learning about whale conservation was deemed most important to learn, followed closely by learning about the marine environment and whale biology. Learning how one can be involved and help support marine conservation was deemed of least importance. Although, on average, this was still considered to be somewhat important. This did show the biggest variance in response and was considered to be not important by half of the respondents

The main reason for the whale watchers in this study to choose their whale watch company turned out to be proximity (43.5%), where a quarter of respondents followed the recommendation of their friends and/or family members. Affiliation with a conservation group and ticket price were negligible. In this line, it also appeared that awareness of the Whale SENSE

logo was very low, with eight of ten respondents not having recognized the logo, which might suggests they are not aware of the program. This was expected as there were hardly any promotional efforts in place to increase brand recognition of the program. The logo was mostly recognized at the ticket booth and in a brochure by those respondents that did recognize the logo. That said, nine in ten respondents indicated they would take a training program, such as Whale SENSE, into consideration when choosing a company for their next whale watch tour. It is also promising to notice that it was very important for whale watchers to know that the naturalist and captain received specialized whale watch training, with women finding this significantly more important than men.

Also, almost half of the respondents did not know the recommended distance of approach to a humpback whale in New England before their tour started. A small percentage (3.8%), of which the majority had their highest level of education in college, expected that one can approach a humpback whale at any distance. It does seem that a third of the respondents were aware that whale watching guidelines exist, as they perceived the distance to approach a humpback whale in New England was more than 100 feet, whereas about 12% either knew or guessed the distance of 100 feet correctly.

6.2 Effectiveness of a whale watch tour

The main goal of this study was to evaluate the educational effectiveness of a whale watch tour and, more specifically, to investigate the extent a whale watch tour increases the awareness of the consequences of individuals regarding their impact on the marine environment. Surprisingly enough, this study determined that whale watchers became less aware of consequences after their whale watch tour. The biggest decline was observed towards those items that measured awareness of consequences on the marine environment, whereas the smallest decline was observed in ones awareness of consequences towards marine mammals. Whale watchers became significantly less worried about the health of the marine environment. Taking demographic variables into account, it showed that older adults were, on average, the only group who became more aware of consequences after a tour. Females did not seem to have changed their overall awareness of consequences after their whale watch tour, which made a significant differences compared to males, which was typified by a somewhat minimal to typical relationship.

The first research hypothesis predicted a positive association between participation in a whale watch tour and a gained level of understanding of the ocean vulnerability. While whale watchers in this study indicated to already be moderately aware of this, post-trip results confirm Hypothesis 1 as significant positive changes were observed in two out of the three items that measured awareness of the ocean's vulnerability. More than 3% of the studied sample became more aware of the oceans' vulnerability after a whale watch tour. Hypothesis 2 predicted a positive relationship between an increase in one's awareness of consequences as an understanding of the oceans' vulnerability also increased. This study contradicts this hypothesis as the overall understanding of the oceans' vulnerability increased while the overall awareness of consequences decreased.

Whale watchers in this study felt slightly responsible for the marine environment. A whale watch tour proved to strengthen ones ascribed feeling of responsibility. Before their tour started, whale watchers strongly believed that they, as individuals, also have the task to protect the marine environment instead of it solely being a governmental task. This belief also proved to be most influenced by a whale watch tour, where whale watchers felt significantly more responsible after their whale watch experience. They also felt significantly more responsible towards their personal contribution of polluting the marine environment, which increased after the whale watch tour. Another significant change was whale watchers feeling more jointly responsible for threats to marine mammals after having seen these animals. Respondents also felt more jointly responsible for threats to the marine environment after their whale watch tour than before, yet this change did not produces a large enough effect for any significance.

A significant change in a whale watchers personal norm to protect the marine environment occurred as a result of going whale watching. On average, the whale watchers in this study felt a slight personal obligation to protect the marine environment before their whale watch tour began. A minimal associated relationship before the trip was found between feeling a stronger norm and individuals who were older, had enjoyed higher levels of formal education and experienced more whale watches. Although the majority did not change their feeling of personal obligation, and a select few indicated they felt less obliged, at least 15% of the whale watchers developed a sense of personal obligation to protect the marine environment upon returning after a whale watch tour.

There was, on average, a slight agreement among the whale watchers regarding contributing money and changing personal behavior to support marine conservation before the tour started. When asked, one was more willing to change one's personal behavior to protect the marine environment if required to do so than to contribute monetarily. A strong significant change was found after their tour in whale watchers' behavioral intentions to pay an additional fee above their ticket price to support marine conservation, which turned from an neutral level of agreement towards a strong slight willingness to do so, accompanied by a typical strength of association. Minimally, yet significant, a positive change was found in the willingness to change ones behavior and to contribute money to support marine conservation, which was still regarded to be the least enticing intention. Overall, 7.4% of 546 whale watchers felt more willing to support marine conservation after their tour.

In general, whale watchers did not appear to know how to support marine mammal conservation before their tour started. Data indicates that this can be attributed to the large majority of respondents who had not experienced a whale watch tour before. Individuals who attended graduate school/university indicated to have a significantly higher perceived level of knowledge then those individuals whose highest level of formal education was high school. A significant change was observed after the trip, with data signifying that about a third of the respondents became aware of how to support marine mammal conservation after a whale watch tour.

Another question of particular interest that this study attempted to answer was the question of whether education received during a whale watch is retained and results in changes in the long term behavior of the watchers, making them more sensitive to marine conservation. A follow up survey conducted one to three months after their whale watch experience showed whale watchers became more aware of consequences. In contrast to what was observed immediately after the whale watch tour, one became more worried about the health of the marine environment and, on average, believed that cleaning products used in their households can negatively affect the marine environment. With regards to behavioral intentions, the willingness to pay an additional fee in the price of their next whale watch tour to support marine conservation was felt more strongly one to three months after the average respondent had experienced their whale watch tour, yet also felt less willing to contribute money to other organizations in support of marine conservation. Of most significance is whether the whale watchers were more likely to change their behavior to protect the marine environment, if required. Unfortunately, one was less willing to make these changes in the long term, as compared to immediately after having observed whales in the wild. Although several respondents indicated that they do think about the environment in contributing to it by several actions, e.g. recycling, not using chemicals on their lawns and gardens to avoid any runoff into the ground water, data indicate that the whale watch tour did not influence these decisions.

6.3 Theoretical perspective

From a theoretical perspective, this study has also examined the predictive validity between several social constructs that are theorized to predict pro-environmental behavior in order to verify if the model proposed is a good fit for supporting marine conservation within the context of whale watching. The model used in this study drew linkages from the value-belief-norm theory of pro-environmental behavior and the theory of cognitive hierarchy in which problem perception of the vulnerability of the ocean was linked with cognitive constructs that are theorized to predict pro-environmental behavior to support marine conservation. The causal order of relations within the VBN-model has received empirical support (De Groot & Steg, 2008) and can also be supported by the findings in this study.

It was suggested that awareness of consequences can influence other cognitions, such as norms and intentions (e.g. Fulton et al., 1996, Schwartz, 1977, Vaske & Donnelly, 1999) which might lead to support towards marine conservation. Correlation supported confirmation of the third research hypothesis, as people with more awareness of consequences shared a higher ascription of responsibility ($r = .482$, explaining 23.3% of the variance in ascribed responsibility). Awareness of consequence also showed a substantial relationship with personal norm ($r = .465$, explaining 2.3% of the variance) and behavioral intentions ($r = .469$, explaining 22%). However, according to Schwartz's norm activation theory (Schwartz, 1977), one must be both aware of consequences of one's actions as well as that the individual must feel some responsibility for their actions (i.e. ascription of responsibility) in order for the personal norm to be influenced. Both concepts combined accounted for a stronger predictive power towards one personal norm ($R = .532$) and explained more variance in personal norm (28.3%) than awareness of consequences (.465, 21.6%) and ascription of responsibility ($r = .451$, 20.4%) separately, as the

VBN-model (Stern, 1999) suggests. The fourth research hypothesis, stating that a higher personal norm to support marine conservation is found by individuals with a higher ascription of responsibility, can be confirmed. These findings also support Schwartz's Norm Activation Model (Schwartz, 1999) to be a better fit within predicting individuals to support marine conservation within the context of whale watching than the adapted VBN-model used in this study. According to the cognitive hierarchy, norms influence the intention towards a certain behavior. In this study, it showed that someone's personal obligation to protect the marine environment explained 39.8% in the variance of someone's behavioral intention with a very substantial correlation (r = .631), suggesting that if you know someone's personal norm towards protecting the marine environment, you can be almost certain that you know his or her intentions to support marine conservation. These findings would therefore be consistent in the underlying supposition that support for marine conservation has a moral dimension.

Related to the concept of norms is the influence of a person´s values on his or her worldview and beliefs towards the environment (Stern, Dietz & Guagnano, 1995; Wurzinger & Johanson, 2006 as cited in Tartaglia & Grosbois, 2009). The personal norm, which is experienced as a moral obligation to act to protect whatever is threatened, is derived from the individual's relevant general and environmental values. This study, albeit not hypothesized, also showed a significant and typical relationship between biocentric value orientations and personal norm (r = .346, explaining 12% of the variance). Whale watchers with biocentric value orientations were, as predicted (H5) and confirmed with a substantial correlation and explaining 19.9% of the variance, more aware of adverse consequences on the marine environment. Findings in this study therefore showed that awareness of consequences seems to originate from biocentric value orientations, as postulated by the actual VBN-model (Stern, 1999).

6.4 Future research

6.4.1 Theoretical framework

One concern with the model used lies in the weak predictive power between the problem perception of one being aware of vulnerability of the oceans' health and awareness of consequences. The AC scale was questioned as a measure of the value orientations, proposed by the VBN-theory, as well as from the proposed determinant of "problem perception" which was predicted to affect someone's level of awareness of consequences. Yet, problem perception did not explain a lot of variance in awareness of consequences. This could mean that items for problem perception should be adapted and added for further research. However, Fulton et al. (1996) suggest that if an individual values the marine environment highly and believes it is important to protect, it is likely that this person may be more aware of the consequences of his or her behavior on the environment. With the majority of respondents expressing a protectionist viewpoint towards the marine environment, it can be suggested that the individuals in this study were, in fact, aware of an environmental problem as activation of a personal norm takes place once an individual perceived environmental conditions that threaten the marine environment (Stern et al., 1999). This could make the concept of problem perception obsolete. Taking these findings into account, a new proposed model, which fits Schwartz's Norm

Activation Model (1977, see Figure 6), should be tested with these added paths in a new sample in order to test and develop the model and see if new findings match the results found here.

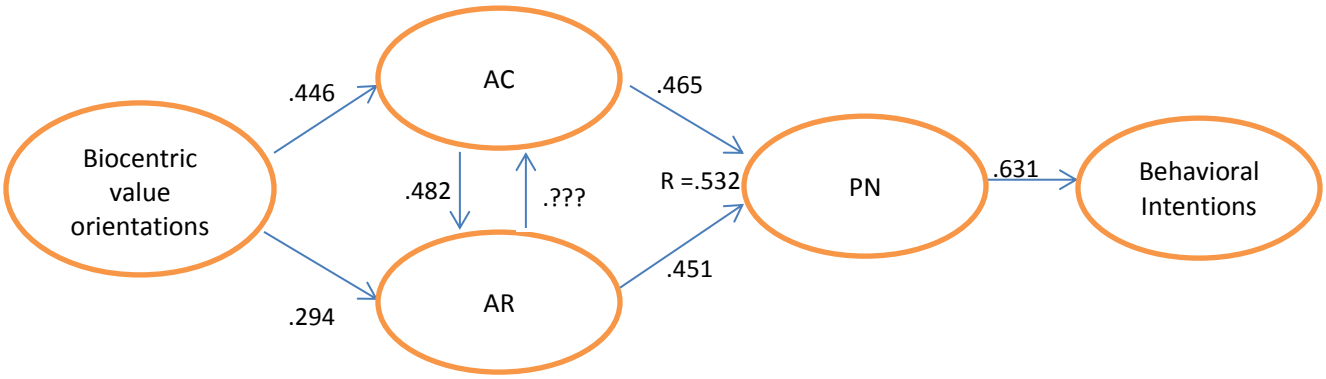

Figure 6: Proposed model for future research (AC = Awareness of consequences, AR = Ascription of Responsibility, PN = Personal Norm.)

However, 19.9% of the variance in awareness of consequences was explained by value orientations and 7.5% by the awareness that the oceans are vulnerable. This suggests that a large proportion of awareness of consequences remained unexplained by the model presented in this study. One question that is interesting for further research is to investigate whether a whale watch tour makes someone more responsible or does one first have to be aware of consequences before becoming responsible.

Based on the evidence presented here, an extensive approach to provoking feelings of responsibility seems worthwhile. Data in this study showed that ascription of responsibility can be split in two separate constructs: "joint human responsibility" and "personal/individual-looking." Given that these constructs provided a good fit and also demonstrated a high construct validity, it is worthwhile for future research to construct two general scales to assess these two new items and create three to four items on each scale that prove to be both high on construct validity as measurement reliability. Framing interpretation in which emphasis is placed on awareness of consequences from personal actions on the marine environment that affects an individual's own personal life might heighten the latter of the two suggested constructs. This may provide a new tool useful in its own right and assist in creating new information that supports behavioral change towards supporting marine conservation

6.4.2 Additional topics

Findings in this study might have been more powerful if measurement of expectations of whale watchers were included in the pre-trip survey. As a result, further studies should ascertain and profile the whale watchers expectations (e.g. amount of whales, species, and proximity of the whales to the boat or boat to the whales). Another way of considering this issue is to measure how significant marketing materials are to passenger expectations. Marketing materials are part of an overall factor of promotion that may influence customers' expectation levels. Within the context of whale watching, both whale watch companies and tour operators tend to promote

close pictures of whales, dramatic behaviors or videos to make their business more attractive. Whether the general public views these tools as marketing material only, or considers them to be a realistic view of the trip, should be examined. Similarly, one should examine whether the whale sightings posted to company websites or social media outlets reflect a general view as to what potential whale watchers expect. As satisfaction is a function of the degree to which expectations are met, it might be worthwhile to determine measurements of this as well.

Furthermore, the expectation level regarding what whale watchers expect they can do to support marine mammal conservation should be addressed. In this study, whale watchers were asked their perceived knowledge on this topic, which catered for an evaluative response. Yet determining what whale watchers know they can do before they experience a whale watch tour, and more importantly what they don't know in order to fill their knowledge gaps, should be evaluated. This is important as it removes barriers for creating this sense of empowerment in order to get whale watchers more involved in active participation towards marine conservation.

One other noteworthy shortcoming is related to the motives of whale watchers. Gnoth (1997) emphasizes that the pursuit of pleasure is personally orientated and attitudes towards pleasurable activities, such as holidays, are formed in order to satisfy the self and not norms. Hence, motives for going on a holiday should be taken into account when studying holiday behavior, especially when the desired pro-environmental behavior is characterized by aspects (e.g. making an effort to help others) that are counteracting the initial purpose of going on holiday at the first place (e.g. pleasure, comfort, good for self). This concept has not been addressed in this study, whereas Budeanu (2007) notes that whether or not individuals decide to behave in a pro-environmental manner is influenced by the hedonic value that they connect to their leisure time.

6.5 Recommendations to the whale watching industry

Although effective interpretation towards educating tourists about whales seems to be in place, observations and quotes from whale watchers indicates that conservation messaging is not used to its full potential on the whale watch tours in New England. While whale watch companies who participate in the Whale SENSE program do influence whale watchers by enhancing their awareness of oceans' vulnerability, provoke stronger feelings of responsibility towards the marine environment and a personal obligation to protect the marine environment as well as foster behavioral intentions, naturalists should, at the same time, more strongly emphasize the adverse consequences of personal actions towards the marine environment and communicate initiatives for whale watchers to help protect the marine environment.

As a baseline information of awareness of the vulnerability of the oceans' health in itself did not seem to be of predictive influence towards cognitive constructs that are able to influence pro-environmental behavior, a whale watch tour should make sure to touch upon people's biocentric value orientations of the marine environment. These patterns of beliefs that embrace protection of the marine environment appear to be a likely predictor of a person being aware of the consequences as, according to the findings in this study and supported by the VBN-model

(Stern et al., 1999). In raising awareness of the oceans' vulnerability and the personal impacts that humans have, the interpretation on the whale watch boats needs to speak to the values that underlie the public's concerns about the oceans. However, it is suggested that besides creating concern for marine mammals, interpretation should also focus on negative consequences for human beings derived from adverse consequences on the marine environment. Communicating through the general public's egoistic value orientation can result in pro-environmental behavior, as long as the pro-environmental awareness is directed to what a person wants and needs and the corresponding action needed to maintain their wants and needs. This should result in whale watchers elevating the importance of this issue and making connections so that this issue becomes personally relevant to them, which is assumed to increase their awareness of consequences.

Theoretically, this should result in a personal norm that creates a predisposition to provide support. The extended norm activation theory implies that a norm for personal action also depends on "a belief that one's action can make a difference (AC) and that one is personally responsible (AR) for putting pressure on industry or government to do what is right" (Stern et al., 1986, p. 209). Providing this information should therefore touch upon the environmental consequences of people's behavior which would create two new beliefs: (1) an awareness of the consequences regarding the objects of one's personal norm; and (2) an ascription of personal responsibility for causing or preventing these consequences (Stern et al., 1999). Therefore, it is key to make whale watchers aware that they can make a difference, not just for the marine environment but also for themselves. With the whale watching industry in New England being one of the epicenters of whale watching in the world, a lack of information regarding how they can make a difference can be regarded as a huge opportunity loss to use the general public as a social carrier for responsible stewardship. We are living in a time in which public support towards marine conservation is necessary due to degradation of the marine environment and more marine mammals becoming endangered around the world, in large part due to human induced activities.

In previous experimental research by Harms (2011), it was discovered that evoking emotions and provoking feelings of responsibility among the whale watchers yielded the most effective whale watch environment in terms of fostering behavioral intentions towards supporting whale conservation, significantly more so than only providing information and facts about whale behavior and ecology. This would suggest naturalists should use a critical-issues focused approach and act as a tour guide/conservation agent and advocate responsible behavior while heightening feelings of personal responsibility. Guilt is a negative emotion that motivates people to take action to reverse previous actions they have done before which resulted in this guilty feeling. The sense of responsibility that is generated along with the guilty feeling makes the individual look for a solution to get rid of this negative feeling of guilt. When that solution is offered, the individual will respond more rapidly to follow up on that solution (Vermandele, 2009). However, this study showed that the average whale watcher does not know how to support marine conservation and thus, does not know how to get rid of their guilty feelings when provoked. The interaction between the guide and the tourists should therefore suggest a basis of individual empowerment by provoking feelings of guilt which can be turned into

feelings of empowerment once whale watchers are provided with solutions of how they can get rid of their feelings of guilt. Harms (2011) also stated that whale watchers whose feelings of guilt were turned into feelings of empowerment showed a significantly higher level of satisfaction after a whale watch tour than whale watchers who were only provided with basic information and facts about whales. After all, this makes the whale watchers leave their experience on somewhat of an optimistic note by making them feel empowered as they perceive that their actions can make a difference in the area of conservation of the marine environment and its inhabitants.

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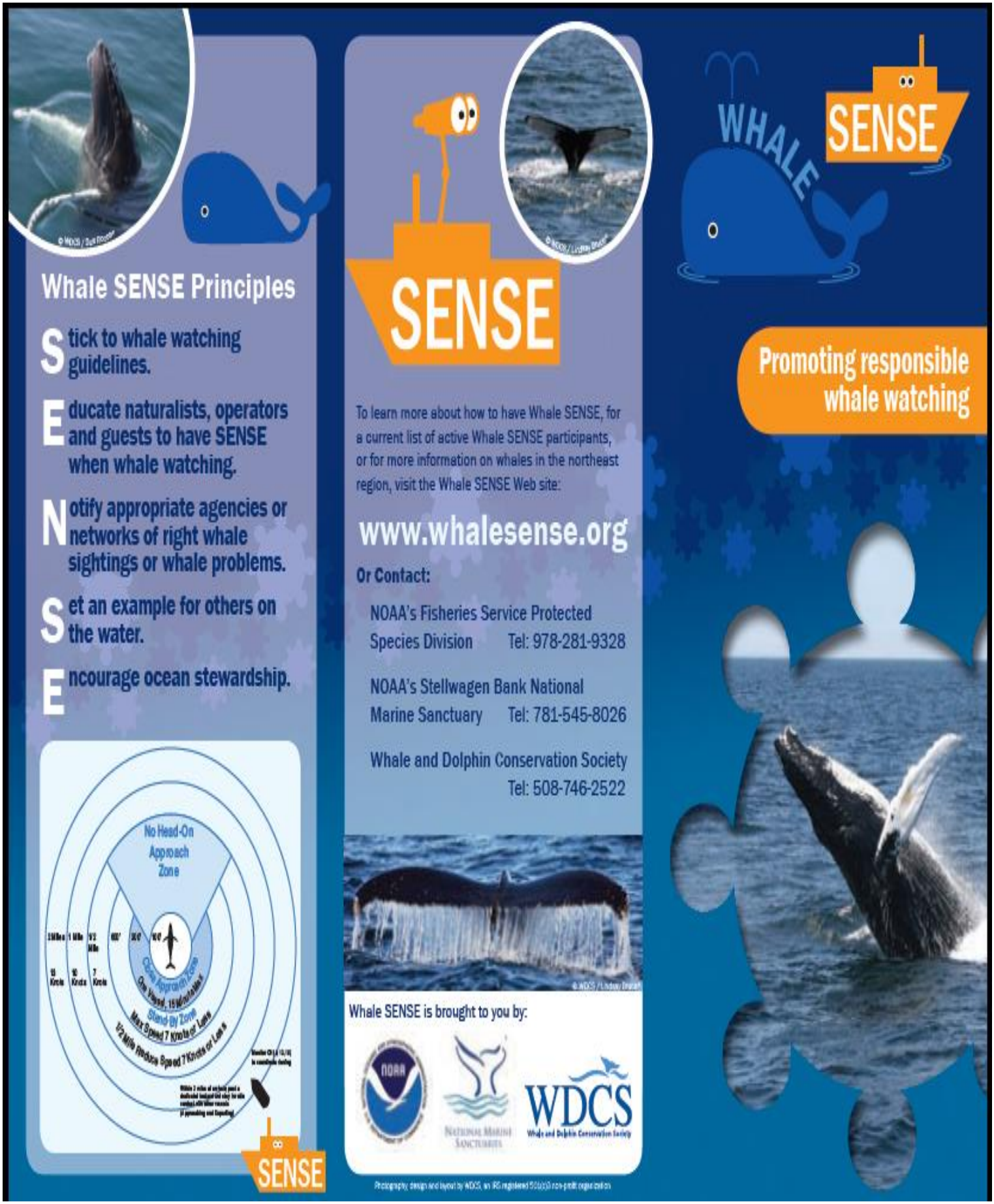
WATCHING WHALES: MORE THAN MEETS THE EYES

Appendices

Appendix A: Whale Sense Brochure



WHALE SENSE

What is Whale SENSE?

Whale SENSE is a collaborative, voluntary program recognizing commercial whale watching operations committed to a higher standard of whale watching.

Participating companies agree to minimize negative impacts on whales by:

- Engaging in responsible viewing practices;
- Providing customers with a high standard of education;
- Promoting ocean stewardship and conservation.

Whale SENSE is a partnership program between NOAA's Fisheries Service, NOAA's Stellwagen Bank National Marine Sanctuary, and the Whale and Dolphin Conservation Society and was developed in conjunction with the Northeast Regional commercial whale watching community.

The purpose of Whale SENSE is to promote responsible whale watching through a standardized education and training program for whale watching captains and naturalists, all of whom are committed to providing their passengers and the whales with the best possible experience.

What does it take to have Whale SENSE?

All Whale SENSE whale watching companies voluntarily:

- Participate in yearly training and recertification;
- Provide passage for Whale SENSE evaluators;
- Visibly post whale watching operational procedures;
- Adhere to regulations;
- Promote marine stewardship through yearly conservation projects;
- Participate in annual reviews to ensure active compliance.

Upon successful completion of training and evaluation, Whale SENSE businesses receive materials identifying them as active Whale SENSE participants featuring the Whale SENSE logo and current calendar year.

Whale SENSE: The SENSE-ible choice!

Choosing a Whale SENSE program participant for your whale watching tour is a simple and effective personal choice that promotes and supports responsible whale watching and whale conservation.

Does your whale watch company have Whale SENSE?

To learn more about how to have Whale SENSE, for a current list of active Whale SENSE participants, or for more information on whales in the northeast region, visit the Whale SENSE Web site:

www.whalesense.org

Whale SENSE helps to protect these species

Finback Whale
Balaenoptera physalus

Length: 59 - 73' Weight: 40 - 80 tons
W. North Atlantic Pop: over 2,000
Status: Endangered / Depleted

Humpack Whale
Megaptera novaeangliae

Length: 45 - 56' Weight: 25 - 45 tons
Gulf of Maine Population: over 800
Status: Endangered / Depleted

North Atlantic Right Whale
Eubalaena glacialis

Length: 45 - 55' Weight: upto 70 tons
Species Population: less than 400
Status: Critically Endangered / Depleted

Minke Whale
Balaenoptera acutorostrata

Length: 23 - 33' Weight: 5 - 10 tons
Canadian East Coast Pop: over 3,000
Status:

All whales are protected under the Marine Mammal Protection Act (MMPA). Endangered and/or threatened whales are also protected by the Endangered Species Act (ESA).

* All photographs were taken in accordance with NOAA's Northeast whale watching guidelines. Vessels should never intentionally approach a whale within 100ft. If whales approach a vessel within 100ft, disengage engines and wait for the animal to be clear of the vessel before departing the area.

We thank you for taking a few minutes to fill out this survey, which helps us advance the whale watch experience in New England. Your participation is completely voluntary and all responses are confidential. An important part of this study is a second shorter follow-up survey, which is extremely valuable to us. This will be distributed during our one-hour trip back to the harbor. We would like for you to write down your first name and the initial of your last name on this survey and the follow-up survey that will follow. Your name will not be used, but your ID is essential for statistical purposes. Thank you!

1. Your first name:_____ & the initial of your last name: _____

2. How many times have you been whale watching before today? _____ (First time? Please write 0)

3. What was the main reason for you to choose this whale watch company? Please choose one option.

□ Ticket price □ Proximity to where I am/was staying □ Company's update on whale sightings
□ Groupon □ Recommendation from hotel □ Recommendation by friends/family
□ Previous experience □ Affiliation with conservation group □ Other, namely _____

4. Please rate the following aspects on how important they are to you by checking the appropriate box.

	Not at all important to me	Not important to me	Important to me	Very important to me
Being as close to the whales as possible				
Having the boat maintain a safe distance from the whales				
Learning about whale biology				
Learning about whale conservation				
Learning about the marine environment				
Learning what I can do to help support marine conservation				
Knowing that the boat is following guidelines				
Knowing that the naturalist and captain received specialized whale watch training				
Seeing other wildlife (birds and seals for example)				

5. Please indicate to which extent you agree or disagree with the following statements. There are no right or wrong answers to what you believe. (1 = "strongly disagree"; to 7 = "strongly agree").

	Strongly disagree			← →			Strongly agree
Oceans are so large, it is unlikely that humans will cause any lasting damage to them (**Problem awareness**)	1	2	3	4	5	6	7
Polluted oceans are able to clean themselves	1	2	3	4	5	6	7
We do not need to worry about the health of the oceans because we will develop new technologies to keep them clean	1	2	3	4	5	6	7
The primary purpose of the marine environment should be to benefit people (**VO – use**)	1	2	3	4	5	6	7
Recreational use of the marine environment is more important than protecting the species that live there	1	2	3	4	5	6	7
The needs of humans are more important than the marine environment	1	2	3	4	5	6	7
Humans should manage the marine environment such that humans benefit	1	2	3	4	5	6	7
The marine environment has value whether humans are present or not (**VO – protectionist**)	1	2	3	4	5	6	7

		Strongly disagree			← →			Strongly agree
The marine environment should be protected for its own sake rather than meet the needs of humans		1	2	3	4	5	6	7
Recreational use of the marine environment should not be allowed if it damages the area		1	2	3	4	5	6	7
I am worried about the health of the marine environment	(AC)	1	2	3	4	5	6	7
A lot of species of marine life will become extinct within the next few decades		1	2	3	4	5	6	7
Cleaning products that I use in my house on a daily basis can have a negative effect on the marine environment		1	2	3	4	5	6	7
The loss of marine mammals can negatively affect human health		1	2	3	4	5	6	7
I am jointly responsible for threats to the marine environment	(AR)	1	2	3	4	5	6	7
Because my contribution to pollution into the marine environment is very small, I do not feel responsible for marine pollution		1	2	3	4	5	6	7
Authorities rather than the citizens are responsible for the marine environment		1	2	3	4	5	6	7
I feel at least co-responsible for threats to marine mammals		1	2	3	4	5	6	7
I feel a personal obligation to protect the marine environment	(PN)	1	2	3	4	5	6	7
I would contribute money to support marine conservation	(BI)	1	2	3	4	5	6	7
I am willing to pay an additional fee above the ticket price of my whale watch tour to support marine conservation		1	2	3	4	5	6	7
I am willing to change my behavior if this is required to protect the marine environment		1	2	3	4	5	6	7
I don't know how to help support marine mammal conservation	(knowledge)	1	2	3	4	5	6	7

6. Do you recognize the following logo? Yes, I have seen it (please indicate where): ☐ No

☐ At the ticket booth

☐ In a brochure

☐ On-board the vessel

☐ Somewhere else, namely: _____

We would now like to ask you a few questions about yourself to help us understand different characteristics of respondents. This will allow us to compare your answers with other people. Thank you.

I am ☐male ☐ female & I am _____ years old.

What is your country of residence? _____ . If US, which state? _____

My highest level of education is: ☐High school ☐ College ☐ Graduate school/University

E-mail address: _____@_____

Please write down your e-mail if you don't mind being contacted by us to complete just a few questions by e-mail, which would finalize our study. Your e-mail address will only be used for this purpose and is not collected and/or sold for any commercial and/or marketing purposes. Thank you! We will be collecting your survey and pen from you shortly. This was the first part of the survey. We would kindly like to ask you to fill out a shorter follow-up survey, which will be distributed at the end of your whale watch trip. On behalf of the crew, thank you and enjoy your whale watch!

Thank you once again for taking your time to complete this short follow-up questionnaire

1. For statistical purposes, please write down your first name and initial of your last name.

   Your first name:_____& the initial of your last name: _____

2. What do you believe has been the key message of this tour?

   _____

3. Could you please indicate to what extent you agree with the following statements?
   (**1 = "strongly disagree"; to 7 = "strongly agree"**).

	Strongly disagree			← →			Strongly agree
Oceans are so large, it is unlikely that humans will cause any lasting damage to them	1	2	3	4	5	6	7
Polluted oceans are able to clean themselves	1	2	3	4	5	6	7
We do not need to worry about the health of the oceans because we will develop new technologies to keep them clean	1	2	3	4	5	6	7
I am worried about the health of the marine environment	1	2	3	4	5	6	7
A lot of species of marine life will become extinct within the next few decades	1	2	3	4	5	6	7
Cleaning products that I use in my house on a daily basis can have a negative effect on the marine environment	1	2	3	4	5	6	7
The loss of marine mammals can negatively affect human health	1	2	3	4	5	6	7
I am jointly responsible for threats to the marine environment	1	2	3	4	5	6	7
Because my contribution to pollution into the marine environment is very small, I do not feel responsible for marine pollution	1	2	3	4	5	6	7
Authorities rather than the citizens are responsible for the marine environment	1	2	3	4	5	6	7
I feel at least co-responsible for threats to marine mammals	1	2	3	4	5	6	7
I feel a personal obligation to protect the marine environment	1	2	3	4	5	6	7
I would contribute money to support marine conservation	1	2	3	4	5	6	7
I am willing to pay an additional fee above the ticket price of my whale watch tour to support marine conservation	1	2	3	4	5	6	7
I am willing to change my behavior if this is required to protect the marine environment	1	2	3	4	5	6	7
I know how to help support marine mammal conservation	1	2	3	4	5	6	7

Please use the space below to add any additional thoughts or comments you might have on your experience today.

Appendix D: Factor and reliability analyses conceptual framework

	Mean[a]	Standard deviation	Item total correlation[b]	Alpha item if deleted[c]
Items	*1*	*2*	*3*	*4*
Value Orientation (Use dimension)[d] (α = .743)				
The primary purpose of the marine environment should be to benefit people	2.21	1.672	.588	.654
Recreational use of the marine environment is more important than protecting the species that live there	1.69	1.371	.543	.689
The needs of humans are more important than the marine environment	2.14	1.525	.587	.659
Humans should manage the marine environment such that humans benefit	3.01	2.021	.476	.740
Value Orientation (Protectionist dimension)[d] (α = .66)				
The marine environment has value whether humans are present or not	6.02	1.691	.417	.618
The marine environment should be protected for its own sake rather than to meet the needs of humans	5.81	1.624	.562	.417
Recreational use of the marine environment should not be allowed if it damages the area	5.80	1.639	.416	.617
Awareness of ocean's vulnerability[d] (α = .77)				
Oceans are so large, it is unlikely that humans will cause any lasting damage to them	1.69	1.478	.598	.687
Polluted oceans are able to clean themselves	1.95	1.395	.564	.721
We do not need to worry about the health of the oceans because we will develop new technologies to keep them clean	1.65	1.253	.639	.646
Awareness of Consequences[d] (α = .75)				
I am worried about the health of the marine environment	5.54	1.516	.570	.681
A lot of species of marine life will become extinct within the next few decades	5.31	1.438	.571	.682
Cleaning products that I use in my house on a daily basis can have a negative effect on the marine environment	5.29	1.659	.505	.720
The loss of marine mammals can have a negative effect on the health of human beings	5.67	1.551	.548	.693
Behavioral Intentions (α = .78)				
I would contribute money to support marine conservation	4.32	1.685	.709	.608
I am willing to pay an additional fee above the ticket price of my whale watch tour to support marine conservation	4.30	1.883	.519	.639
I am willing to change my behaviour if this is required to protect the marine environment	5.42	1.503	.497	.827

[a] Variables measured on seven-point scales of 1 "strongly disagree" to 7 "strongly agree."

[b] Pearson correlation coefficient between score on individual item and sum of scores on remaining items.

[c] Cronbach alpha when item removed from scale.

[d] Variables coded on 5-point scales from 1 "strongly disagree" to 5 "strongly agree."

Appendix E: One-way ANOVA: Biocentric Value orientations / Formal level of education

Descriptives

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1 High School	215	5,6403	1,51141	,10308	5,4371	5,8435	1,00	7,00
2 College	421	5,8852	1,27336	,06206	5,7632	6,0072	1,00	7,00
3 Graduate school / University	351	6,0437	1,03800	,05540	5,9347	6,1527	1,00	7,00
Total	987	5,8882	1,26132	,04015	5,8094	5,9670	1,00	7,00

Test of Homogeneity of Variances

Levene Statistic	df1	df2	Sig.
17,141	2	984	,000

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	21,701	2	10,851	6,902	,001
Within Groups	1546,965	984	1,572		
Total	1568,666	986			

Contrast Coefficients

Contrast	Education		
	1 High School	2 College	3 Graduate school / University
1	1	-1	0
2	1	0	-1
3	0	1	-1

Contrast Tests

		Contrast	Value of Contrast	Std. Error	t	df	Sig. (2-tailed)
avgprotection	Assume equal variances	1	-,2449	,10510	-2,330	984	,020
		2	-,4034	,10859	-3,715	984	,000
		3	-,1585	,09063	-1,749	984	,081
	Does not assume equal variances	1	-,2449	,12032	-2,035	372,337	,043
		2	-,4034	,11702	-3,447	338,254	,001
		3	-,1585	,08319	-1,905	769,623	,057

Appendix F: One-way ANOVA: Problem Perception / Age Groups

Descriptives

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1,00 Teenagers	121	1,8430	,97570	,08870	1,6674	2,0186	1,00	6,33
2,00 Young adults	263	1,6008	,83998	,05180	1,4988	1,7027	1,00	6,00
3,00 Middle aged adults	454	1,8003	1,23004	,05773	1,6868	1,9137	1,00	7,00
4,00 Older adults	62	2,0591	1,50956	,19171	1,6758	2,4425	1,00	7,00
Total	900	1,7656	1,12473	,03749	1,6920	1,8391	1,00	7,00

Test of Homogeneity of Variances

Levene Statistic	df1	df2	Sig.
11,327	3	896	,000

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	13,759	3	4,586	3,658	,012
Within Groups	1123,495	896	1,254		
Total	1137,254	899			

Contrast Coefficients

	agestages			
Contrast	1,00 Teenagers	2,00 Young adults	3,00 Middle aged adults	4,00 Older adults
1	1	-1	0	0
2	1	0	-1	0
3	1	0	0	-1
4	0	1	-1	0
5	0	1	0	-1
6	0	0	1	-1

Contrast Tests

	Contrast	Value of Contrast	Std. Error	t	df	Sig. (2-tailed)
Assume equal variances	1	,2422	,12301	1,969	896	,049
	2	,0427	,11456	,373	896	,710
	3	-,2162	,17489	-1,236	896	,217
	4	-,1995	,08677	-2,299	896	,022
	5	-,4584	,15809	-2,900	896	,004
	6	-,2588	,15161	-1,707	896	,088
Does not assume equal variances	1	,2422	,10272	2,358	204,878	,019
	2	,0427	,10583	,403	232,157	,687
	3	-,2162	,21124	-1,023	87,864	,309
	4	-,1995	,07756	-2,573	696,028	,010
	5	-,4584	,19859	-2,308	70,143	,024
	6	-,2588	,20022	-1,293	72,483	,200

Appendix G: One-way ANOVA: Awareness of Consequences / Age Groups

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
1,00 Teenagers		121	5,2893	1,03330	,09394	5,1033	5,4752	2,50	7,00
2,00 Young adults		262	5,4800	1,12543	,06953	5,3431	5,6169	2,00	7,00
3,00 Middle aged adults		452	5,6716	1,18112	,05556	5,5625	5,7808	1,00	7,00
4,00 Older adults		62	5,6371	1,36131	,17289	5,2914	5,9828	1,00	7,00
Total		897	5,5617	1,16566	,03892	5,4853	5,6381	1,00	7,00
Model	Fixed Effects			1,15966	,03872	5,4857	5,6377		
	Random Effects				,09707	5,2528	5,8706		

Test of Homogeneity of Variances

Levene Statistic	df1	df2	Sig.
1,458	3	893	,225

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	16,548	3	5,516	4,102	,007
Within Groups	1200,914	893	1,345		
Total	1217,462	896			

Contrast Coefficients

	agestages			
Contrast	1,00 Teenagers	2,00 Young adults	3,00 Middle aged adults	4,00 Older adults
1	1	-1	0	0
2	1	0	-1	0
3	1	0	0	-1
4	0	1	-1	0
5	0	1	0	-1
6	0	0	1	-1

Contrast Tests

	Contrast	Value of Contrast	Std. Error	t	df	Sig. (2-tailed)
Assume equal variances	1	-,1907	,12746	-1,496	893	,135
	2	-,3824	,11870	-3,222	893	,001
	3	-,3478	,18112	-1,920	893	,055
	4	-,1917	,09004	-2,129	893	,034
	5	-,1571	,16378	-,959	893	,338
	6	,0345	,15705	,220	893	,826
Does not assume equal variances	1	-,1907	,11687	-1,632	252,639	,104
	2	-,3824	,10914	-3,504	211,732	,001
	3	-,3478	,19676	-1,768	97,992	,080
	4	-,1917	,08900	-2,154	566,916	,032
	5	-,1571	,18634	-,843	81,828	,402
	6	,0345	,18159	,190	74,141	,850

Appendix H: One-way ANOVA: Awareness of Consequences / Formal Level of Education

Descriptives

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1 High School	218	5,3658	1,19608	,08101	5,2062	5,5255	1,00	7,00
2 College	427	5,5519	1,19430	,05780	5,4383	5,6655	1,00	7,00
3 Graduate school / University	353	5,6801	1,12848	,06006	5,5620	5,7983	1,00	7,00
Total	998	5,5566	1,17636	,03724	5,4835	5,6297	1,00	7,00

Test of Homogeneity of Variances

Levene Statistic	df1	df2	Sig.
1,275	2	995	,280

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	13,329	2	6,665	4,853	,008
Within Groups	1366,333	995	1,373		
Total	1379,662	997			

Contrast Coefficients

Contrast	Education		
	1 High School	2 College	3 Graduate school / University
1	1	-1	0
2	1	0	-1
3	0	1	-1

Contrast Tests

		Contrast	Value of Contrast	Std. Error	t	df	Sig. (2-tailed)
avgACpre	Assume equal variances	1	-,1861	,09754	-1,908	995	,057
		2	-,3143	,10094	-3,114	995	,002
		3	-,1282	,08430	-1,521	995	,129
	Does not assume equal variances	1	-,1861	,09951	-1,870	436,525	,062
		2	-,3143	,10085	-3,117	439,315	,002
		3	-,1282	,08335	-1,538	764,241	,124

Appendix I: One-way ANOVA: Ascription of Responsibility / Age Groups

Descriptives

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1,00 Teenagers	121	4,5496	1,06407	,09673	4,3581	4,7411	1,00	7,00
2,00 Young adults	262	4,8308	1,13527	,07014	4,6927	4,9689	2,00	7,00
3,00 Middle aged adults	451	5,0157	1,17742	,05544	4,9067	5,1247	1,00	7,00
4,00 Older adults	62	5,1277	1,11433	,14152	4,8447	5,4107	2,50	7,00
Total	896	4,9064	1,15656	,03864	4,8306	4,9823	1,00	7,00

Test of Homogeneity of Variances

Levene Statistic	df1	df2	Sig.
1,207	3	892	,306

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	25,328	3	8,443	6,426	,000
Within Groups	1171,843	892	1,314		
Total	1197,170	895			

Contrast Coefficients

	Agestages			
Contrast	1,00 Teenagers	2,00 Young adults	3,00 Middle aged adults	4,00 Older adults
1	1	-1	0	0
2	1	0	-1	0
3	1	0	0	-1
4	0	1	-1	0
5	0	1	0	-1
6	0	0	1	-1

Contrast Tests

		Contrast	Value of Contrast	Std. Error	t	df	Sig. (2-tailed)
avgARpre	Assume equal variances	1	-,2812	,12598	-2,232	892	,026
		2	-,4661	,11735	-3,972	892	,000
		3	-,5781	,17901	-3,229	892	,001
		4	-,1849	,08903	-2,077	892	,038
		5	-,2969	,16187	-1,834	892	,067
		6	-,1120	,15525	-,721	892	,471
	Does not assume equal variances	1	-,2812	,11948	-2,353	247,842	,019
		2	-,4661	,11150	-4,181	205,864	,000
		3	-,5781	,17142	-3,372	118,200	,001
		4	-,1849	,08940	-2,068	561,850	,039
		5	-,2969	,15795	-1,880	93,329	,063
		6	-,1120	,15199	-,737	80,903	,463

Appendix J: One-way ANOVA: Ascription of Responsibility / Formal Level of Education

Descriptives

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1 High School	218	4,6770	1,12300	,07606	4,5271	4,8269	1,00	7,00
2 College	426	4,9182	1,17575	,05697	4,8063	5,0302	1,00	7,00
3 Graduate school / University	353	5,0489	1,15826	,06165	4,9276	5,1701	1,00	7,00
Total	997	4,9117	1,16512	,03690	4,8393	4,9841	1,00	7,00

Test of Homogeneity of Variances

Levene Statistic	df1	df2	Sig.
,661	2	994	,517

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	18,669	2	9,335	6,959	,001
Within Groups	1333,411	994	1,341		
Total	1352,080	996			

Contrast Coefficients

Contrast	Education		
	1 High School	2 College	3 Graduate school / University
1	1	-1	0
2	1	0	-1
3	0	1	-1

Contrast Tests

		Contrast	Value of Contrast	Std. Error	t	df	Sig. (2-tailed)
avgARpre	Assume equal variances	1	-,2412	,09645	-2,501	994	,013
		2	-,3719	,09977	-3,727	994	,000
		3	-,1306	,08336	-1,567	994	,117
	Does not assume equal variances	1	-,2412	,09503	-2,539	455,542	,011
		2	-,3719	,09791	-3,798	470,572	,000
		3	-,1306	,08394	-1,556	754,280	,120

Appendix K: One-way ANOVA: Ascription of Responsibility / Whale watching experience

Descriptives

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
0 1st time	504	4,7664	1,16174	,05175	4,6647	4,8680	1,00	7,00
1 2nd time	246	5,0257	1,22575	,07815	4,8718	5,1797	1,00	7,00
2 3rd time	97	4,9450	1,12396	,11412	4,7185	5,1715	2,00	7,00
3 3 - 10 times before	187	4,9871	1,13734	,08317	4,8230	5,1512	2,75	7,00
4 more than 10 times before	38	4,9298	1,39948	,22702	4,4698	5,3898	1,75	7,00
Total	1072	4,8863	1,18174	,03609	4,8155	4,9572	1,00	7,00

Test of Homogeneity of Variances

Levene Statistic	df1	df2	Sig.
2,080	4	1067	,081

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	14,338	4	3,585	2,582	,036
Within Groups	1481,315	1067	1,388		
Total	1495,654	1071			

Contrast Coefficients

	Whale watching Experience				
Contrast	0 1st time	1 2nd time	2 3rd time	3 between 3 and 10 times before	4 more than 10 times before
1	1	-1	0	0	0
2	1	0	-1	0	0
3	1	0	0	-1	0
4	1	0	0	0	-1
5	0	1	-1	0	0
6	0	1	0	-1	0
7	0	1	0	0	-1
8	0	0	1	-1	0
9	0	0	1	0	-1
10	0	0	0	1	-1

Contrast Tests

		Contrast	Value of Contrast	Std. Error	t	df	Sig. (2-tailed)
avgARpre	Assume equal variances	1	-,2594	,09164	-2,830	1067	,005
		2	-,1786	,13064	-1,367	1067	,172
		3	-,2207	,10089	-2,188	1067	,029
		4	-,1635	,19821	-,825	1067	,410
		5	,0807	,14127	,571	1067	,568
		6	,0387	,11431	,338	1067	,735
		7	,0959	,20537	,467	1067	,641
		8	-,0421	,14743	-,285	1067	,775
		9	,0152	,22549	,067	1067	,946
		10	,0573	,20966	,273	1067	,785
	Does not assume equal variances	1	-,2594	,09373	-2,767	463,537	,006
		2	-,1786	,12531	-1,426	138,420	,156
		3	-,2207	,09796	-2,253	339,092	,025
		4	-,1635	,23285	-,702	40,937	,487
		5	,0807	,13832	,584	190,717	,560
		6	,0387	,11413	,339	414,270	,735
		7	,0959	,24010	,400	46,191	,691
		8	-,0421	,14121	-,298	196,457	,766
		9	,0152	,25409	,060	56,667	,953
		10	,0573	,24178	,237	47,428	,814

Appendix L: One-way ANOVA: Personal Norm / Age Groups

Descriptives

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1,00 Teenagers	121	4,76	1,483	,135	4,49	5,03	1	7
2,00 Young adults	259	4,93	1,494	,093	4,74	5,11	1	7
3,00 Middle aged adults	446	5,27	1,576	,075	5,13	5,42	1	7
4,00 Older adults	61	5,33	1,814	,232	4,86	5,79	1	7
Total	887	5,11	1,569	,053	5,00	5,21	1	7

Test of Homogeneity of Variances

Levene Statistic	df1	df2	Sig.
2,231	3	883	,083

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	38,312	3	12,771	5,265	,001
Within Groups	2141,726	883	2,426		
Total	2180,038	886			

Contrast Coefficients

	agestages			
Contrast	1,00 Teenagers	2,00 Young adults	3,00 Middle aged adults	4,00 Older adults
1	1	-1	0	0
2	1	0	-1	0
3	1	0	0	-1
4	0	1	-1	0
5	0	1	0	-1
6	0	0	1	-1

Contrast Tests

	Contrast	Value of Contrast	Std. Error	t	df	Sig. (2-tailed)
Assume equal variances	1	-,17	,171	-,970	883	,332
	2	-,51	,160	-3,215	883	,001
	3	-,57	,245	-2,321	883	,021
	4	-,35	,122	-2,851	883	,004
	5	-,40	,222	-1,810	883	,071
	6	-,05	,213	-,256	883	,798
Does not assume equal variances	1	-,17	,164	-1,016	235,982	,311
	2	-,51	,154	-3,330	199,651	,001
	3	-,57	,269	-2,113	101,503	,037
	4	-,35	,119	-2,913	562,870	,004
	5	-,40	,250	-1,604	80,216	,113
	6	-,05	,244	-,223	72,915	,824

Appendix M: One-way ANOVA: Personal Norm / Formal Level of Education

Descriptives

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1 High School	217	4,82	1,557	,106	4,62	5,03	1	7
2 College	421	5,08	1,647	,080	4,92	5,23	1	7
3 Graduate school / University	350	5,33	1,502	,080	5,17	5,48	1	7
Total	988	5,11	1,586	,050	5,01	5,21	1	7

Test of Homogeneity of Variances

Levene Statistic	df1	df2	Sig.
1,868	2	985	,155

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	34,412	2	17,206	6,918	,001
Within Groups	2449,782	985	2,487		
Total	2484,194	987			

Contrast Coefficients

	Education		
Contrast	1 High School	2 College	3 Graduate school / University
1	1	-1	0
2	1	0	-1
3	0	1	-1

Contrast Tests

	Contrast	Value of Contrast	Std. Error	t	df	Sig. (2-tailed)
Assume equal variances	1	-,25	,132	-1,905	985	,057
	2	-,50	,136	-3,676	985	,000
	3	-,25	,114	-2,189	985	,029
Does not assume equal variances	1	-,25	,133	-1,892	458,720	,059
	2	-,50	,133	-3,774	445,383	,000
	3	-,25	,114	-2,200	762,477	,028

Appendix N: One-way ANOVA: Personal Norm / Whale watching experience

Descriptives

	N	Mean	Std. Deviation-	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
0 1st time	499	5,02	1,540	,069	4,89	5,16	1	7
1 2nd time	241	5,06	1,646	,106	4,85	5,27	1	7
2 3rd time	97	5,13	1,643	,167	4,80	5,47	1	7
3 3 - 10 times before	185	5,41	1,519	,112	5,19	5,63	1	7
4 more than 10 times before	37	5,46	1,757	,289	4,87	6,05	1	7
Total	1059	5,13	1,583	,049	5,03	5,22	1	7

Test of Homogeneity of Variances

Levene Statistic	df1	df2	Sig.
1,478	4	1054	,207

ANOVA

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	25,293	4	6,323	2,537	,039
Within Groups	2627,003	1054	2,492		
Total	2652,297	1058			

Contrast Coefficients

	Whale watching Experience				
Contrast	0 1st time	1 2nd time	2 3rd time	3 between 3 and 10 times before	4 more than 10 times before
1	1	-1	0	0	0
2	1	0	-1	0	0
3	1	0	0	-1	0
4	1	0	0	0	-1
5	0	1	-1	0	0
6	0	1	0	-1	0
7	0	1	0	0	-1
8	0	0	1	-1	0
9	0	0	1	0	-1
10	0	0	0	1	-1

Contrast tests

	Contrast	Value of Contrast	Std. Error	t	df	Sig. (2-tailed)
Assume equal variances	1	-,04	,124	-,308	1054	,758
	2	-,11	,175	-,628	1054	,530
	3	-,39	,136	-2,846	1054	,005
	4	-,44	,269	-1,619	1054	,106
	5	-,07	,190	-,378	1054	,705
	6	-,35	,154	-2,259	1054	,024
	7	-,40	,279	-1,425	1054	,154
	8	-,28	,198	-1,399	1054	,162
	9	-,33	,305	-1,067	1054	,286
	10	-,05	,284	-,171	1054	,864
Does not assume equal variances	1	-,04	,126	-,302	447,453	,763
	2	-,11	,181	-,609	130,859	,544
	3	-,39	,131	-2,946	333,084	,003
	4	-,44	,297	-1,466	40,209	,150
	5	-,07	,198	-,363	177,576	,717
	6	-,35	,154	-2,263	409,825	,024
	7	-,40	,308	-1,291	46,221	,203
	8	-,28	,201	-1,378	182,241	,170
	9	-,33	,334	-,975	61,455	,333
	10	-,05	,310	-,157	47,361	,876

Appendix O: One-way ANOVA: Behavioral Intentions / Age Groups

Descriptives

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1,00 Teenagers	121	4,7231	1,26775	,11525	4,4950	4,9513	1,50	7,00
2,00 Young adults	262	4,7048	1,30315	,08051	4,5463	4,8634	1,00	7,00
3,00 Middle aged adults	450	5,0107	1,38734	,06540	4,8822	5,1393	1,00	7,00
4,00 Older adults	62	4,8360	1,49056	,18930	4,4575	5,2146	1,00	7,00
Total	895	4,8702	1,36042	,04547	4,7810	4,9595	1,00	7,00

Test of Homogeneity of Variances

Levene Statistic	df1	df2	Sig.
1,287	3	891	,278

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	18,742	3	6,247	3,403	,017
Within Groups	1635,819	891	1,836		
Total	1654,561	894			

Contrast Coefficients

	Agestages			
Contrast	1,00 Teenagers	2,00 Young adults	3,00 Middle aged adults	4,00 Older adults
1	1	-1	0	0
2	1	0	-1	0
3	1	0	0	-1
4	0	1	-1	0
5	0	1	0	-1
6	0	0	1	-1

Contrast Tests

	Contrast	Value of Contrast	Std. Error	t	df	Sig. (2-tailed)
Assume equal variances	1	,0183	,14893	,123	891	,902
	2	-,2876	,13875	-2,073	891	,038
	3	-,1129	,21162	-,533	891	,594
	4	-,3059	,10530	-2,905	891	,004
	5	-,1312	,19136	-,686	891	,493
	6	,1747	,18355	,952	891	,341
Does not assume equal variances	1	,0183	,14059	,130	239,472	,897
	2	-,2876	,13251	-2,170	204,070	,031
	3	-,1129	,22162	-,509	107,120	,612
	4	-,3059	,10372	-2,949	573,856	,003
	5	-,1312	,20571	-,638	84,417	,525
	6	,1747	,20028	,872	76,283	,386

Appendix P: One-way ANOVA: Behavioral Intentions / Formal Level of Education

Descriptives

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1 High School	218	4,7095	1,40894	,09543	4,5214	4,8976	1,00	7,00
2 College	424	4,8003	1,42184	,06905	4,6646	4,9360	1,00	7,00
3 Graduate school / University	353	5,0439	1,29333	,06884	4,9085	5,1793	1,50	7,00
Total	995	4,8668	1,38003	,04375	4,7810	4,9527	1,00	7,00

Test of Homogeneity of Variances

Levene Statistic	df1	df2	Sig.
2,957	2	992	,052

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	18,342	2	9,171	4,853	,008
Within Groups	1874,708	992	1,890		
Total	1893,050	994			

Contrast Coefficients

	education		
Contrast	1 High School	2 College	3 Graduate school / University
1	1	-1	0
2	1	0	-1
3	0	1	-1

Contrast test

	Contrast	Value of Contrast	Std. Error	t	df	Sig. (2-tailed)
Assume equal variances	1	-,0908	,11457	-,793	992	,428
	2	-,3344	,11842	-2,824	992	,005
	3	-,2436	,09905	-2,459	992	,014
Does not assume equal variances	1	-,0908	,11779	-,771	441,627	,441
	2	-,3344	,11766	-2,842	429,848	,005
	3	-,2436	,09750	-2,498	768,925	,013

Appendix Q: One-way ANOVA: Behavioral Intentions / Whale watching experience

Descriptives

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
0 1st time	501	4,8007	1,32893	,05937	4,6841	4,9174	1,00	7,00
1 2nd time	246	4,7459	1,54822	,09871	4,5515	4,9404	1,00	7,00
2 3rd time	97	5,0120	1,32926	,13497	4,7441	5,2799	1,50	7,00
3 3 - 10 times before	187	5,1551	1,27693	,09338	4,9709	5,3393	1,00	7,00
4 more than 10 times before	38	5,1754	1,47906	,23993	4,6893	5,6616	2,00	7,00
Total	1069	4,8826	1,38574	,04238	4,7994	4,9658	1,00	7,00

Test of Homogeneity of Variances

Levene Statistic	df1	df2	Sig.
3,303	4	1064	,011

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	26,720	4	6,680	3,511	,007
Within Groups	2024,130	1064	1,902		
Total	2050,850	1068			

Contrast Coefficients

	Whale watching Experience				
Contrast	0 1st time	1 2nd time	2 3rd time	3 between 3 and 10 times before	4 more than 10 times before
1	1	-1	0	0	0
2	1	0	-1	0	0
3	1	0	0	-1	0
4	1	0	0	0	-1
5	0	1	-1	0	0
6	0	1	0	-1	0
7	0	1	0	0	-1
8	0	0	1	-1	0
9	0	0	1	0	-1
10	0	0	0	1	-1

Contrast test

	Contrast	Value of Contrast	Std. Error	t	df	Sig. (2-tailed)
Assume equal variances	1	,0548	,10738	,510	1064	,610
	2	-,2113	,15300	-1,381	1064	,168
	3	-,3543	,11820	-2,998	1064	,003
	4	-,3747	,23208	-1,615	1064	,107
	5	-,2661	,16536	-1,609	1064	,108
	6	-,4091	,13381	-3,058	1064	,002
	7	-,4295	,24041	-1,787	1064	,074
	8	-,1431	,17258	-,829	1064	,407
	9	-,1634	,26396	-,619	1064	,536
	10	-,0204	,24543	-,083	1064	,934
Does not assume equal variances	1	,0548	,11519	,476	426,953	,635
	2	-,2113	,14745	-1,433	135,774	,154
	3	-,3543	,11065	-3,202	345,767	,001
	4	-,3747	,24717	-1,516	41,658	,137
	5	-,2661	,16721	-1,591	203,371	,113
	6	-,4091	,13588	-3,011	428,108	,003
	7	-,4295	,25945	-1,655	50,367	,104
	8	-,1431	,16412	-,872	187,705	,385
	9	-,1634	,27529	-,594	61,737	,555
	10	-,0204	,25746	-,079	48,834	,937

Appendix R: One-way ANOVA: Perceived knowledge / Whale watching experience

Descriptives

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
0 1st time	473	3,82	1,694	,078	3,67	3,98	1	7
1 2nd time	232	3,97	1,805	,119	3,74	4,20	1	7
2 3rd time	90	4,26	1,739	,183	3,89	4,62	1	7
3 3 - 10 times before	174	4,30	1,704	,129	4,04	4,55	1	7
4 more than 10 times before	35	4,83	1,636	,276	4,27	5,39	1	7
Total	1004	4,01	1,738	,055	3,91	4,12	1	7

Test of Homogeneity of Variances

Levene Statistic	df1	df2	Sig.
,362	4	999	,836

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	60,407	4	15,102	5,079	,000
Within Groups	2970,425	999	2,973		
Total	3030,832	1003			

Contrast Coefficients

	Whale watching Experience				
Contrast	0 1st time	1 2nd time	2 3rd time	3 between 3 and 10 times before	4 more than 10 times before
1	1	-1	0	0	0
2	1	0	-1	0	0
3	1	0	0	-1	0
4	1	0	0	0	-1
5	0	1	-1	0	0
6	0	1	0	-1	0
7	0	1	0	0	-1
8	0	0	1	-1	0
9	0	0	1	0	-1
10	0	0	0	1	-1

Contrast test

	Contrast	Value of Contrast	Std. Error	t	df	Sig. (2-tailed)
Assume equal variances	1	-,15	,138	-1,067	999	,286
	2	-,43	,198	-2,184	999	,029
	3	-,48	,153	-3,116	999	,002
	4	-1,01	,302	-3,331	999	,001
	5	-,29	,214	-1,334	999	,182
	6	-,33	,173	-1,903	999	,057
	7	-,86	,313	-2,746	999	,006
	8	-,04	,224	-,193	999	,847
	9	-,57	,343	-1,668	999	,096
	10	-,53	,319	-1,658	999	,098
Does not assume equal variances	1	-,15	,142	-1,039	434,096	,299
	2	-,43	,199	-2,175	123,302	,032
	3	-,48	,151	-3,158	306,820	,002
	4	-1,01	,287	-3,503	39,595	,001
	5	-,29	,218	-1,309	167,682	,192
	6	-,33	,175	-1,877	383,362	,061
	7	-,86	,301	-2,855	47,407	,006
	8	-,04	,224	-,193	176,933	,847
	9	-,57	,332	-1,727	65,612	,089
	10	-,53	,305	-1,736	50,000	,089

Appendix S: One-way ANOVA: Multiple regression analysis AR & AC to PN

Descriptive Statistics

	Mean	Std. Deviation	N
pre: I feel a personal obligation to protect the marine environment	5,13	1,583	1059
avgARpre	4,8965	1,17480	1059
avgACpre	5,5485	1,19666	1059

Correlations

		pre: I feel a personal obligation to protect the marine environment	avgARpre	avgACpre
Pearson Correlation	pre: I feel a personal obligation to protect the marine environment	1,000	,451	,465
	avgARpre	,451	1,000	,485
	avgACpre	,465	,485	1,000
Sig. (1-tailed)	pre: I feel a personal obligation to protect the marine environment	.	,000	,000
	avgARpre	,000	.	,000
	avgACpre	,000	,000	.
N	pre: I feel a personal obligation to protect the marine environment	1059	1059	1059
	avgARpre	1059	1059	1059
	avgACpre	1059	1059	1059

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	avgARpre[a]	.	Enter
2	avgACpre[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: pre: I feel a personal obligation to protect the marine environment

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	,451[a]	,204	,203	1,414	,204	270,177	1	1057	,000
2	,532[b]	,283	,282	1,342	,079	117,069	1	1056	,000

a. Predictors: (Constant), avgARpre

b. Predictors: (Constant), avgARpre, avgACpre

ANOVA[c]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	539,935	1	539,935	270,177	,000[a]
	Residual	2112,361	1057	1,998		
	Total	2652,297	1058			
2	Regression	750,744	2	375,372	208,457	,000[b]
	Residual	1901,553	1056	1,801		
	Total	2652,297	1058			

a. Predictors: (Constant), avgARpre

b. Predictors: (Constant), avgARpre, avgACpre

c. Dependent Variable: pre: I feel a personal obligation to protect the marine environment

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	2,148	,186		11,531	,000		
	avgARpre	,608	,037	,451	16,437	,000	1,000	1,000
2	(Constant)	,813	,216		3,769	,000		
	avgARpre	,398	,040	,295	9,904	,000	,765	1,307
	avgACpre	,426	,039	,322	10,820	,000	,765	1,307

a. Dependent Variable: pre: I feel a personal obligation to protect the marine environment

Excluded Variables[b]

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics		
						Tolerance	VIF	Minimum Tolerance
1	avgACpre	,322[a]	10,820	,000	,316	,765	1,307	,765

a. Predictors in the Model: (Constant), avgARpre

b. Dependent Variable: pre: I feel a personal obligation to protect the marine environment

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions		
				(Constant)	avgARpre	avgACpre
1	1	1,972	1,000	,01	,01	
	2	,028	8,458	,99	,99	
2	1	2,950	1,000	,00	,00	,00
	2	,028	10,230	,38	,95	,08
	3	,022	11,519	,62	,05	,91

a. Dependent Variable: pre: I feel a personal obligation to protect the marine environment

Appendix T: Crosstabulation Change in AC * Change in AR

Did a change occur in AC? * Did a change occur in AR? Crosstabulation

Count

		Did a change occur in AR?			
		Felt less responsible after a whale watch tour	not changed	Felt more responsible after a whale watch tour	Total
Did a change occur in AC?	* Became less aware of consequences	4	28	1	33
	* not changed	12	441	34	487
	* Became more aware of consequences	1	16	8	25
Total		17	485	43	545