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Evaluation of a Developing Ecotourism Industry: Whale-Watching in The Gulf of Tribugá, Colombia

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The ecotour industry continues to grow with a distinct focus on providing the public with up-close encounters with cetaceans. As a result, research focusing on both the effects of ecotourism on cetaceans and the efficacy of conservation-focused educational interventions for whale-watching operators is necessary to monitor and develop industry standards. Each year, whale-watching tours target humpback whales along their Colombian Pacific breeding grounds. There are many benefits to ecotourism in this area, including the use of whale-watching vessels as a platform for scientific research and environmental education. However, some whale-watching operators may lack species-specific knowledge and/or do not follow the suggested industry guidelines. Researchers held educational seminars for whale-watching staff at six hotels that border the Gulf of Tribugá. Seminars focused on whale anatomy, behavior, anthropogenic effects on the species, and sustainable whale-watching protocols. Participants were asked to complete a questionnaire aimed to assess constructs related to the conservation of this species. This self-report information was accompanied by implicit measures (e.g., sighting duration, distance from whales) recorded during tours in situ. Behavioral observations aimed at assessing whales' response to ecotour vessels demonstrated that whales increased rates of surface-active behaviors (e.g., tail slashes) with increasing nearness and duration. Whale-watching operators' conduct during sightings demonstrated that positive attitudes toward humpback whales did not translate into adherence to sustainable practices. This relationship between the whale-watching operators' questionnaire results and their behavior in the field demonstrates the need for careful monitoring of this developing industry. This project represents a preliminary evaluation of this budding ecotour industry. Continued efforts to increase knowledge while promoting self-advocacy, positive perceived behavioral control, subjective norms, behavioral intentions, and attitudes towards these animals will enable the safeguarding of near-shore waters essential for breeding and nursing humpback whales.

Humpback whales (*Megaptera novaeangliae*) are seasonal breeders, as their behavior and social structure are determined by an annual migratory cycle (Chittleborough, 1958; Clapham, 1996; Dawbin, 1966). Whales from the G-stock (International Whaling Commission, 1998) annually migrate between feeding grounds close to the Antarctic Peninsula and the Magellan Strait to breeding areas in coastal waters of Peru, Ecuador, Colombia, Panama and Costa Rica (Acevedo et al., 2007; Félix & Haase, 2001; Flórez-González, 1991; Rasmussen & Palacios, 2013). Although this species was heavily hunted in the 20th century, most stocks are showing signs of recovery (Reilly et al., 2008) due to the moratorium implemented by the International Whaling Commission in 1982. Additionally, a new focus on conservation was achieved through whale-watching, which provided an alternative, non-lethal use for whales (Chen, 2011; Cisneros-Montemayor, Sumaila, Kaschner, & Pauly, 2010; O'Connor, Campball, Cortez, & Knowles, 2009).

The most recent reports estimate that whale-watching generates approximately $413 million and is responsible for 5,700 jobs in the United States alone. Global assessments estimate 19,000 jobs and approximately $2.1 billion in profits (Cisneros et al., 2010; Cunningham, Huijbens & Wearing, 2012; Hoyt & Iñiguez, 2008, O´Connor, Campbell, Cortez, Knowles, 2009). In Colombia, the development of the whale-watching industry has been limited to a few localities (e.g., Bahía Malaga in the southern Colombian Pacific and the Amazon basin, Hoyt & Iñiguez, 2008). In addition to the economic benefits, studies show that whale-watching promotes the empowerment of local communities, leads to on-site and off-site benefits for visitors

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(e.g., increased emotional connection to marine fauna and reduction of visitors' impact), and allows for the use of tourism vessels as platforms for research and environmental education (Cisneros-Montemayor et al., 2010; Cunningham et al., 2012; O´Connor et al., 2009; Scheyvens, 1999; Wilson & Tisdell, 2003; Zeppel & Muloin, 2008).

Whale-watching operations are growing in Latin America (Hoyt & Iñíguez, 2008). Without strict adherence to established policies, ecotourism can have deleterious effects on humpback whales. Mothers with calves are particularly vulnerable, and are known to alter their habitat use patterns in the presence of whale-watching vessels (Cartwright et al., 2012). Behavioral impacts have also been reported regardless of the presence of calves (Corkeron, 1995). These include increasing dive times and depth when boats approach, as well as changing swim speed and direction when followed by tourism vessels (Avila et al., 2015; Scheidat et al., 2004). Similarly, the presence of whale-watching vessels has been shown to affect surface-active behaviors (e.g., breaching), surfacing, singing, feeding, and resting (Félix, 2004; Parsons, 2012). It is hypothesized that high level of behavioral change may affect cetacean energy expenditure, stress, health, and fitness (see Parsons, 2012).

Ecotourism can be broadly defined as a strategy to simultaneously support wildlife conservation, environmental education, equal opportunity, and the local economy, while still maintaining the natural integrity of the destination (Powell & Ham, 2008). In order to accomplish these aims, ecotourism must be nature-based, environmentally and culturally educative, and sustainably managed (i.e., the industry should support both local economies and conservation; Blamey, 2010). Thus, for whale-watching tours in the Gulf of Tribugá to be considered a legitimate ecotourism industry, it must be monitored continuously to ensure that it does not negatively effect cetaceans. In this study, we took a two-pronged approach to evaluating the effects of whale-watching operations on humpback whales in the Gulf of Tribugá: (1) the Theory of Planned Behavior (TPB) was leveraged to gauge the effectiveness of an environmental education initiative, which advocated for adherence to established whale-watching regulations; and (2) whales' behavioral reactions to the presence of boats were evaluated to determine the relationship between compliance and surface-active behaviors.

According to the TPB, there are three major constructs that contribute to the development of a behavioral intention including attitude, subjective norms, and perceived behavioral control (PBC; Ajzen, 1985) These are formed according to behavioral beliefs (an individual's belief about the outcome of a target behavior), normative beliefs (how the individual perceives that others view the behavior), and control beliefs (whether or not the individual feels in control of their ability to perform the behavior). In essence, the TPB holds that each behavioral belief is tied to an individual's expected outcome of the behavior, but also that each individual places a subjective value on that outcome – resulting in an attitude (Turaga, Howarth, & Borsuk, 2010). In the case of our study, the TPB states that attitudes are developed as a result of an individual's belief regarding the attitude object (e.g., humpback whales). Attitudes then interact with PBC, as well as with subjective norms, to form a behavioral intention such as increasing following distances during observation periods (Figure 1; Ajzen, 1991).

The TPB was selected for this study as it has been previously utilized to predict pro-environmental behaviors such as compliance in national parks (Goh, Ritchie, & Wang, 2017) and recycling behavior (Cheung, Chan, & Wong, 1999). The TPB's application to pro-environmental behaviors, such as responsible ecotourism, operates under the assumption that individuals are motivated by self-interest (e.g., avoidance of punishment and/or in pursuance of a reward). This is in contrast to theorists who maintain that pro-environmental behaviors are pro-social in nature (e.g., with a focus on saving the environment), and instead utilize theories such as the Schwartz (1977) Norm Activation Model (Bamberg & Möser, 2007). According to the TPB, the self-interest of study participants could intervene in the formation of a behavioral intention (Bamberg & Möser, 2007).

That is, if an individual believes that others highly value a pro-environmental behavior (a subjective norm), they are more likely to act in their own self-interest and seek to be viewed favorably by completing the behavior. Additionally, the TPB has been used effectively in cross-cultural studies (Oreg & Katz-Gerro, 2006). This focus on self-interest and demonstrated cross-cultural capability lends support to the use of the TPB in our evaluation of this small for-profit industry in rural Colombia.

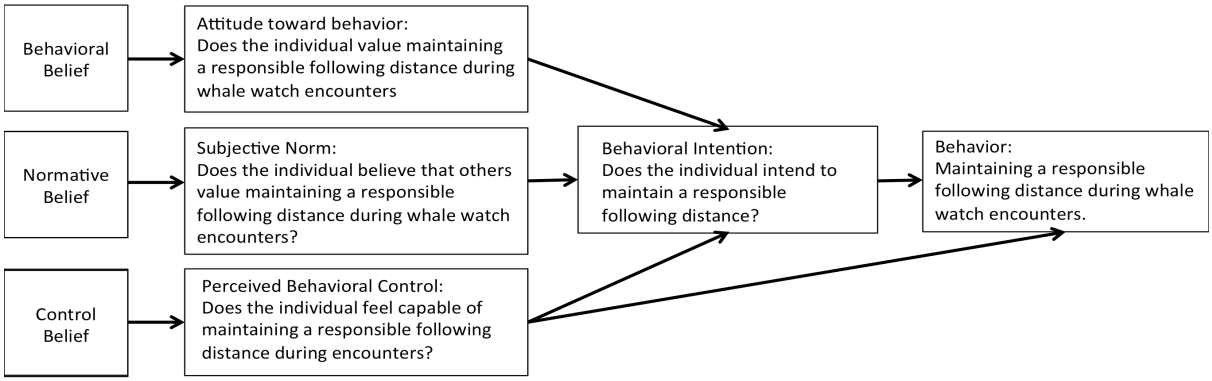

Figure 1. **The Theory of Planned Behavior as it applies to the behavior of maintaining a responsible following distance during humpback whale encounters (adapted from Azjen, 1991).**

As our study aimed to evaluate and improve humpback whale-watching practices in the Gulf of Tribugá, we focused on the behavior of whale-watching operators responsible for activity in the Gulf. Target behaviors included maintaining an acceptable distance from the whales, as well as limiting the amount of time spent observing them. Thus, for the purposes of this study, whales were treated as the attitude object. Subjective norms were defined as the perceived social pressure to comply with, or ignore, regulations regarding following distance. Additionally, PBC was defined as the operator's perceived ease or difficulty of protecting humpbacks by following the aforementioned regulations. This study examines the behavioral intention of whale-watching operators to adhere to the existing regulations as well as their immediate behavioral response in the field. Next, we evaluated the effects of the ecotour operators' behavior on the whales themselves (e.g., aversive behaviors upon approach, amount of time spent near the vessel, etc.) to determine the efficacy of these procedures in a geographically unique region.

In this study, we focused on evaluating whale-watching operators' compliance with established regulations using the TPB as the underlying structure of our analysis. Thus, we predicted that a strong positive correlation between TPB constructs will correspond to observed compliance. Additionally, we predicted that compliance in whale-watching operators would result in less evasive initial reactions and shorter dive times in whales during encounters. Humpback whale behavioral responses to tour boats were also explored using surface-active behavior data acquired through observations of these encounters.

Method

Study Area

The Gulf of Tribugá is located in the Chocó province, in the northern portion of the Colombian Pacific Coast. It is comprised of several smaller bays and borders the locality of El Valle, municipality of Bahía Solano (6°06'N, 77°25'W) to the north, and with Cape Corrientes, municipality of Nuquí (6°06'N, 77°25'W) to the south (Díaz, 2002). The main logistic station for the current project was Coquí (5°36'N, 77°21'W), a small fishing community located southwest within the Gulf of Tribugá. The Gulf is characterized by a considerably narrow and inclined continental shelf, which causes a 300m isobath to be located a few kilometers from the coast (Galvis & Mojica, 1993).

Questionnaire Data Collection

Hotels that featured whale-watching tours were either recommended by members of the local community in Coquí or discovered through social media. All hotels that offered whale-watching tours were invited to participate in this study either by phone, email, or in-person. The informal nature of ecotours in some of these communities and lack of web presence (especially in smaller hotels) prevented the research team from identifying the exact number of small inns that offered this service. However, this ensured that all of the large hotels, equipped with more advertising and tourist traffic, were included in this study. Regardless of size, most hotels in the Gulf of Tribugá employed one to three tour boat operators.

Seminars on humpback anatomy, behavior, and conservation were held for tourists, hotel owners and/or managers, and tour guides at six hotels located along the Gulf of Tribugá. Conservation topics included habitat displacement, anthropogenic effects, and sustainable whale-watching guidelines. Current Colombian environmental guidelines suggest slowing speed at 400 m, maintaining at least 200 m distance, and following whales for a maximum of 30 min (Arias-Gaviria et al., 2011).

A 23-item questionnaire was administered in order to assess beliefs of key stakeholders in the local ecotour industry (n = 19). There were two to four participants from each of the six hotels. One hotel owner (25% - 50% of participants per hotel) and one to three whale-watching operators (50% - 75% of participants per hotel) attended the environmental seminar, and participated in the questionnaire. The majority of participants were male (95%), ecotour boat operators (87%), and born locally (79%). The average participant age was 42 years old (range = 26 - 70 years old). The questionnaire was designed to evaluate TPB constructs (Ajzen, 1991) as well as knowledge. Questions were based on a 5-point Likert-scale format presented by Miller et al. (2013) to investigate attitudes toward dolphin conservation, and were adapted to accommodate the species differences between humpback whales and delphinids (Table 1). In addition, items within the questionnaire reflected the information presented in the preceding seminar. For example, knowledge-based questions test participants' knowledge on humpback whale behavior, results of disruption, and non-deleterious whale-watching behavior (Table 1).

One to five knowledge, attitude, subjective norms, PBC, and behavioral items were compiled into separate composite item scores (Table 1) in order to statistically assess the relationships between evaluated TPB constructs and observed behaviors (e.g., following distance, and length of time spent observing whales). Overall, the TPB model was utilized to understand operators' willingness and ability to adhere to sustainable whale-watching practices following an educational intervention. Sampling procedures were IRB approved and included a saturation sampling procedure aimed at assessing all of the whale-watching operators in the region encompassing six hotels.

Questionnaire Validation and Reliability

Questionnaires were translated from English to Spanish by two native Colombian speakers, who remained conscious of local dialect and language suitability. Questions were analyzed for readability in English and Spanish and resulted in approximately a seventh-grade reading level in both languages (see Miller et al., 2013, San Norberto et al., 2011). Additionally, the questionnaire had a Flesch-Kincaid Grade level of 6.8, Flesch-Kincaid Ease level of 65.3 (English), a Fernandez-Huerta score of 71.6 and a Flesch-Szigriszt score of 66.8 (Spanish; San Norberto et al., 2011).

A Cronbach's alpha was used to examine the measurement scales, to examine the reliability of survey items and thus identify inadequate items to be removed from the questionnaire. While attitude, behavioral intention, and knowledge-based questions initially appeared to have relatively low reliability levels (Table 1), it is important to note that values much lower than .7 are expected due to the diversity of the psychological constructs measured (Field, 2013; Kline, 1999). These scale items have been adapted from the literature, but have never before been implemented in Colombia to evaluate the local whale-watching industry. Since this research is still in its early and exploratory stages, even a Cronbach's alpha level of .5 was deemed sufficient (Field, 2013; Nunnally, 1978).

Additionally, the small sample size for each questionnaire construct was very low (1-5 items, Table 1) and controlled for any type I error inflation of reliability value (Field, 2013). Therefore, all questionnaire constructs had sufficient reliability. Subjective norms and PBC constructs only contained one item (Table 1), so internal reliability was not necessary.

Table 1

Questions from the Questionnaire as They Related to Knowledge and Each of the Principles of TPB

Knowledge
M = 73.05, *SD* = 17.12, Cronbach's α = .55
Getting in the water or surfing next to a humpback whale could be harmful for the animal and the visitors.
After enough disruptions, wild animals will leave an area altogether.
Humpback whales do not eat while in Colombian waters.
I can stay next to a humpback whale for an average of 30 minutes without causing any negative impact.
I can stay 200 meters next to a humpback whale without causing it to flee.
Attitude
M = 89.47, *SD* = 13.53, Cronbach's α = .58
I care about the well-being of humpback whales.
I feel a special connection to humpback whales in the wild.
Subjective Norms
M = 87.37, *SD* = 19.10
Protecting humpback whales will have a positive impact for the entire ecosystem.
Perceived Behavioral Control
M = 43.16, *SD* = 23.35
It is too difficult for someone like me to help protect the whales. *
Behavioral Intention
M = 72.63, *SD* = 20.77, Cronbach's α = .54
I am interested in keeping a distance of 200m or more from a humpback whale.
I am interested in keeping my observation of the whales to 30 minutes.

Note. Each construct from the questionnaire is accompanied by the mean of all 19 participants from the six different hotels, the standard deviation, and Cronbach's alpha where applicable. Knowledge, attitude, subjective norms, and PBC items were based on a five-point scale with responses ranging from 1 (strongly disagree) to 5 (strongly agree). Behavioral intention items were presented on a five-point scale with responses ranging from 1 (very disinterested) to 5 (very interested). *Indicates that an item was reversed during coding for analysis.

Boat Survey Data Collection

To assess the influence of tour boats on humpback whale behavior, dive times (in s), and initial reaction (i.e., neutral, evasive, or approached vessel) were recorded during a total of 43 ecotour encounters. Behavioral ethograms were used in situ to report six different surface-active behavioral events, each operationally defined (Table 2). Each occurrence of breach, belly flop, fluke slap, flipper slap, tail slash, and spy hop were tallied per minute. These behaviors were considered for analysis because whale-watching vessels often target active whales. For each encounter, one to three dive times were collected via stopwatch and reported on the same sighting ethogram. Each encounter's dive times were averaged for analysis. Initial reactions were recorded once at the beginning of an encounter, after following the focal individual or group for 1-2 min. A neutral reaction was recorded when a whale did not attempt to approach the tour boat or noticeably change behavior after the tour boat approached. Evasive reactions were defined by noticeable changes in swim speed, path, or long dives that resulted in out of sight behavior for several minutes and/or resurfacing again at a great distance. Two to three researchers were present on every tour boat trip, and had to produce full consensus on the whale's initial reaction. We also recorded the behavior of whale-watching operators, such as distance from the whales (in m), and duration whales were pursued

(in min). These measures functioned as a mean to assess the implicit beliefs of stakeholders, and act to ground truth the behavioral intention measures gathered in the follow-up TPB questionnaire.

Table 2
Surface Activity Behaviors on Ethogram

Behavioral Events	Definition
Breach	The whale leaps from the water, spinning in the air before re-entry, once or many times in succession.
Belly Flop	The whale leaps partially out of the water and lands on its belly
Fluke Slap	Whale slaps its fluke on the surface of the water. The whale can slap the ventral surface of its flukes on the surface, or it can assume a belly-up posture slapping the dorsal surface of its flukes on the surface.
Flipper Slap	The whale raises a flipper into the air and slaps it down on the surface of the water.
Tail Slash	A whale lashes its fluke and/or peduncle region. It can occur with flukes on a horizontal or vertical plane.
Spy Hop	Whale raises its head vertically out of the water while stationary with flippers outstretched, and without open mouth or extended throat pleats.

Note. Definitions adopted from (Darling, 2001; Frankel et al., 1995).

Data Analysis

Bivariate correlations were conducted using the non-parametric correlation statistic, Kendall's tau (τ). Kendall's tau was chosen as it provides the most accurate gauge for the correlation of small populations (Field, 2013). Cohen (1988)'s cutoffs of small ($r \geq 0.10$), medium ($r \geq 0.30$), and large ($r \geq 0.50$) effect sizes have been converted to Kendall's tau (Gilpin, 1993; Jennions & Møller, 2003; Turchet, Zanotto, Minto, Roda, & Agrawal, 2016). Based upon previous research (Turchet et al., 2016), Kendall's tau coefficients should be interpreted as small ($\tau \geq 0.065$), medium ($\tau \geq 0.195$), and large ($\tau \geq 0.335$). To account for small sample size, alpha levels were adjusted to 0.10 before being reduced by the Bonferroni correction. For this sample set, the Bonferroni correction was considered the most robust univariate technique to control for type I error (Field, 2013). By using the formula $P_{Crit} = \alpha / k$ (where α is the alpha level and k is the number of comparisons), the Bonferroni correction adjusts the level of significance for single tests so that the overall type I error rate remains at a low and desirable level ($\alpha = .10$) across all comparisons. In addition to the Bonferroni correction, data were bootstrapped (according to the obtained P_{Crit} value) to ensure that these tests were robust to non-parametric data (Wright, London, & Field, 2011).

Correlations between TPB constructs demonstrated the relationship between whale-watching operators' attitudes, subjective norms, PBCs, and behavioral intentions. For example, if a boat driver has positive feelings about humpback whales (attitude), believes others positively value conserving this species (subjective norms), and feels an ability to perform the conservation-oriented behavior (PBC), they are likely to form an intention to perform the behavior in question (i.e., maintain proper distance from whales while on the boat). By assessing the relationships between these constructs, we would be able to make recommendations regarding the ability of the TPB to describe the real-world behaviors observed in participants of this region. To investigate the potential relationship between knowledge and the TPB model, the composite score for knowledge-based questions was also correlated with TPB constructs. Additionally, relationships between whale-watching operator behavior and TPB constructs were evaluated. Since five questionnaire constructs were correlated with boat behavior ($\alpha = .10$, $k = 5$), the criterion for significance dropped to $P_{Crit} = .02$ when the Bonferroni correction was applied, and will result in a bootstrapped 98% confidence interval.

To assess whales' reaction to tour boat presence, boat distance was correlated with average dive time (in s) and the whales' initial reaction to the presence of whale-watching vessels. For this, bootstrapped 95% confidence intervals were used. Since tour boats would quickly leave an evasive whale, the implicit measure of "duration" skewed data analysis. Hence, hotel operators that rated "sustainable as measured by duration" were perhaps following humpbacks at unsustainable distances, or not waiting long enough for whales to resurface. Therefore, the measure for duration was omitted from final analyses regarding knowledge-based questions, as well as dive times and initial reactions. However, both distance and duration scores were utilized to correlate surface-active behaviors (Table 4 and 5 respectively). These behaviors were corrected for duration (in min) of tour operations to ensure they were comparable. The criterion for significance ($P_{Crit} = .017$) necessitated a bootstrapped 98.3% confidence interval.

Results

Survey Results

A series of non-parametric statistical tests (Kendal's Tau, 98% BCa bootstrap and Bonferroni corrected $p < 0.05$) were performed to assess the relationships between the TPB constructs (Table 3). In doing so, we found a strong correlation between positive attitudes toward humpback whales and subjective norms, but not with the formation of the behavioral intention to follow sustainable whale-watch guidelines. Similarly, subjective norms and PBC were not significantly correlated with behavioral intention. Although not statistically significant, PBC had an inverse relationship with attitudes and subjective norms (see Table 3 for a summary of results). The knowledge composite score was consistently correlated with multiple constructs in the TPB model. For example, knowledge strongly correlated with attitudes, approached significance with subjective norms, and had a positive (albeit statistically non-significant) relationship with behavioral intention (Table 3). Additionally, individuals who achieved higher scores on all TPB questionnaire constructs were slightly more likely to follow sustainable practices in keeping an appropriate distance from whales while aboard ecotour boats (Table 3).

Table 3
Correlation Table of TPB & Knowledge-based Composite Scores

Variables	1	2	3	4	5
1. Attitude	-				
2. Subjective Norms	0.85** [0.559, 1.00]	-			
3. Perceived Behavioral Control	-0.17 [-0.731, 0.408]	-0.16 [-0.719, 0.431]	-		
4. Behavioral Intention	.00 [-0.520, 0.532]	0.18 [-0.358, 0.643]	0.09 [-0.624, 0.553]	-	
5. Knowledge	0.51** [0.162, 0.739]	0.39* [0.004, 0.703]	-0.19 [-0.586, 0.232]	0.23 [-0.307, 0.690]	-
6. Tour Boat Distance	0.07 [-0.517, 0.581]	0.16 [-0.420, 0.613]	0.12 [-0.388, 0.667]	0.35 [-0.084, 0.649]	0.01 [-0.390, 0.407]

Note. Kendall's tau (τ) correlation coefficients ($N = 19$).

* 98% *BCa CI* is significant.

** 98% *BCa* is significant and Bonferroni corrected $p < 0.100$. BCa bootstrap 98% CIs reported in brackets.

Whale Behavioral Results

In order to assess the relationship between the initial reaction of humpback whales and tour boat distance, a non-parametric Kendal's tau correlational test (BCa bootstrap 95%, Bonferroni corrected $p < 0.05$) was utilized. However, the initial reaction data yielded non-significant results ($\tau = .04$, 95% BCa CI [-0.233, 0.304], $p = 0.808$).

To assess the relationship between dive times and tour boat distance, a similar non-parametric Kendal's tau correlational test (BCa bootstrap 95%, Bonferroni corrected $p < 0.05$) was used. We did not find

a statistically significant correlation between these two variables. However, the medium effect size of the relationship denotes worthwhile investigation: whales appeared to evade boats (i.e., increase dive times) when they were far away and tolerate boats (i.e., decrease dive times) when they were nearby ($\tau = .20$, 95% BCa CI [-0.198, 0.562], $p = 0.233$).

Descriptive statistics of humpback whales group composition and rates of surface-active behaviors were also calculated. Humpback whales engaged in 345 independent surface-active behaviors in only 15 of the 43 sightings in which researchers accompanied hotel operators (Figure 2). Mother-calf pairs (13%), mother-calf-escorts (27%), adults and juveniles (20%), and adult groups (40%) provided different social contexts during surface-active behaviors (Figure 2). Belly flops appeared to be performed most by mother-calf-escorts (n = 140) while flipper slaps appeared to be performed most by groups of adults ($n = 102$).

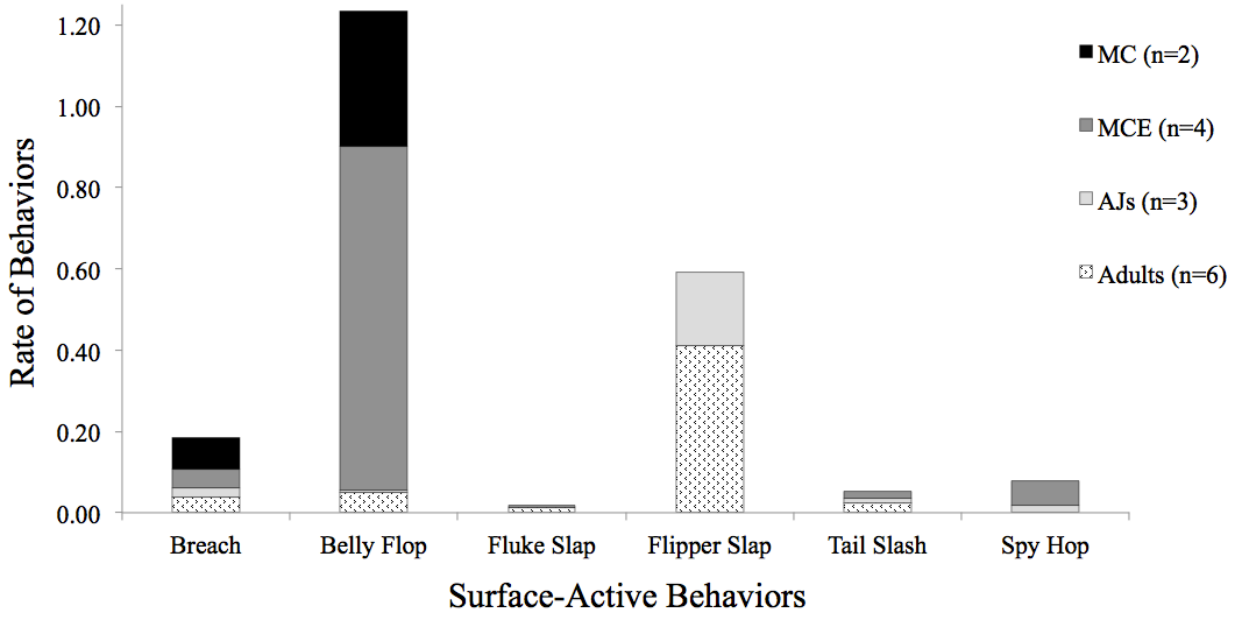

Figure 2. **Descriptive statistics of humpback whales group composition (MC = mother-calf pair; MCE = mother, calf, and escort; AJs = adults and juveniles; Adults) and the rates of surface-active behaviors ($n = 345$) recorded on 15 boat trips.**

Two series of non-parametric statistical tests (Kendal's Tau with BCa bootstrap 98.3%, Bonferroni corrected $p < 0.05$) were performed to assess whether the rates of six humpback whale surface-active behaviors were correlated with tour boat distance (Table 4) and duration (Table 5). Even though there were few statistically significant correlations, rates of surface-active behaviors generally increased when tour boats were nearby (Table 4) and followed humpback whales for a long duration (Table 5). Tail slashes were significantly correlated with encounter duration (Table 5). Interestingly, 93% of the whales exhibiting surface-active behaviors were reported as "neutral" upon approach. The discrepancy between the initial reaction data and theses surface-active behaviors further indicates that while whales appeared to be initially tolerant (i.e., neutral) of tour boats, they may progressively become disturbed by their presence.

Table 4

Correlation Table of Tour Boat Distance to Whale and the Rates of Six Humpback Whale Surface-Active Behaviors

Variables	1	2	3	4	5	6
1. Tour Boat Distance	-					
2. Breach	-0.08 [-0.419, 0.344]	-				
3. Belly Flop	-0.16 [-0.526, 0.237]	0.36† [-0.112, 0.751]	-			
4. Fluke Slap	0.14 [-0.078, 0.348]	0.46** [0.193, 0.754]	0.38† [-0.135, 0.964]	-		
5. Flipper Slap	-0.21 [-0.536, 0.215]	0.40† [-0.059, 0.754]	0.35† [-0.124, 0.840]	0.12 [-0.175, 0.821]	-	
6. Tail Slash	-0.17 [-0.440, 0.141]	0.40† [-0.087, 0.825]	0.60† [-0.015, 1.000]	0.42† [-0.141, 1.000]	0.42† [-0.096, 0.869]	-
7. Spy Hop	0.08 [-0.306, .0422]	-0.13* [-0.250, -0.057]	0.17 [-0.130, 0.776]	-0.07* [-0.193, -0.026]	0.21 [-0.121, 0.779]	0.24 [-0.127, 1.000]

Note. Kendall's tau (τ) correlation coefficients ($N = 39$).

* 98.3% *BCa CI* is significant.

** 98.3% *BCa* is significant and Bonferroni corrected $p < 0.05$.

† Bonferroni corrected $p < 0.05$. *BCa* bootstrap 98.3% CIs reported in brackets.

Table 5

Correlation Table of Tour Boat Duration Spent Following Whales and the Rates of Six Humpback Whale Surface-Active Behaviors

Variables	1	2	3	4	5	6
1. Tour Boat Duration	-					
2. Breach	0.11 [-0.150, 0.361]	-				
3. Belly Flop	0.15 [-0.147, 0.405]	.35† [-.026, .735]	-			
4. Fluke Slap	0.15 [-0.175, 0.390]	0.44** [0.200, 0.740]	0.32† [-0.131, 0.841]	-		
5. Flipper Slap	0.07 [-0.233, 0.319]	0.38† [-0.122, 0.782]	0.27 [-0.124, 0.643]	0.13 [-0.135, 0.628]	-	
6. Tail Slash	0.31** [0.126, 0.486]	0.39† [-0.077, 0.736]	0.50† [-0.034, 0.956]	0.43† [-0.087, 0.976]	0.44† [-0.087, 0.905]	-
7. Spy Hop	0.03 [-0.165, 0.277]	0.04 [-0.196, 0.427]	0.26 [-0.114, 0.702]	-0.07 [-0.005, -0.029]	0.14 [-0.135, 0.600]	0.17 [-0.132, 0.679]

Note. Kendall's tau (τ) correlation coefficients ($N = 39$).

* 98.3% *BCa CI* is significant.

** 98.3% *BCa* is significant and Bonferroni corrected $p < 0.05$.

† Bonferroni corrected $p < 0.05$. BCa bootstrap 98.3% CIs reported in brackets.

Discussion

The Theory of Planned Behavior

The negative relationship between PBC and both attitudes and subjective norms signifies a possible feeling of "powerlessness" on the topic of whale protection, even though attitudes towards whales and subjective norms are vastly positive. However, the positive (yet small and statically non-significant) relationship between PBC and behavioral intention may indicate that stakeholders are likely to form an intention to perform the behavior, if they believe they have control over that behavior.

Due to these statistically mixed results, it is possible that the traditional TPB is not sufficient to fully describe the observed relationships and behaviors. There have been attempts to determine the validity of additional TPB constructs such as moral norms (See Turaga et al., 2010 for a review), which we did not measure for the purposes of this study. However, researchers such as Oreg and Katz-Gerro (2006) have suggested that additional TPB constructs may be necessary, in order to account for cross-cultural use. By including an additional construct in our questionnaire, such as moral norms, we may have revealed significant results (Turaga et al., 2010).

To evaluate this idea that additional constructs may require consideration, we examined the likelihood that knowledge may have played a factor in the observed behavior change. It has been suggested that knowledge and information accuracy may play a role in the TPB (Ajzen, Joyce, Sheikh, & Cote, 2011). The relationship between participant knowledge, multiple TPB constructs, and ecotour operators' ability to follow whales at a sustainable distance indicated that environmental education may play a role in improving whale-watching operators' sustainable behaviors in the field. However, the relationship between knowledge and operator behavior was not comparatively stronger than the relationships with attitude, subjective norms, or even PBC (Table 3). Therefore, it is important to keep these constructs in mind when designing new intervention techniques.

Additionally, it should be acknowledged that due to the remoteness of this region, and the resulting small pool of whale-watching operators, we were provided with a low sample size – even after achieving saturation. It is possible that these non-significant results are an artifact of this phenomenon.

Behavioral Observations

In order to fully evaluate the results of the educational intervention, we also observed whale-watching vessels in the field following the talk. As we observed, not all whale-watching tours behaved in accordance with the established guidelines, even after receiving the intervention. However, this begs the question, why did some operators behave sustainably while others did not?

Previous experience with whales may have contributed to compliance. For example, if the whale-watching operator has had positive encounters with humpbacks while following regulations, they may be more likely to be motivated to comply with regulations in the future. Additionally, the existing relationship between knowledge, attitudes, and subjective norms suggest that work environment may similarly have played a role. For example, staff who work at hotels which do not provide educational outlets regarding whale conservation, may be less motivated to comply than are other whale-watching operators in the area.

Considering that the hotels directly provide whale-watching operators with income, it is reasonable to assume that the workplace could be a major influence for operators' willingness to follow conservation guidelines. If hotel owners and managers encouraged employee education and/or offered incentives to reinforce positive attitudes, or intentions to practice sustainable behaviors, this would likely result in a much larger degree of compliance. To assess this further, it would be best to obtain information concerning the participants' previous participation in educational and social events regarding humpback whales. In addition, it is imperative that whale-watching operators be observed prior to, during, and after intervention(s). If possible, it would be best if operators were not aware of observations as they occur. The positive relationship between the intention to remain 300 m or more away from the whales and actively maintaining an adequate following distance demonstrates that whale-watching operators showed strong alignment between their intentions and behaviors.

Humpback Response to Boats

Although care should be taken with interpretation from small sample sizes, the medium effect size of the dive time data could indicate a biological significance, as individual differences and social variables seem to play a role in these seemingly non-evasive behaviors to nearby boats (Jennions & Møller, 2003; Turner, Ecke, Briand, Haydon, & Blendy 2014). For example, evasive whales would immediately depart even when tour boats were distant, yet occasionally a whale would approach an idle boat. However, it is vital to contextualize these interactions. For example whales that were less evasive, or *tolerant*, of whale-watching boats might have been (1) behaviorally limited because of a dependent calf or (2) accepting of the vessel's approach because their attention was diverted to the intense social interactions occurring within competitive mating groups. Instead of evading boats, these animals continued their preceding behavioral repertoire.

The "evade-far and tolerate-nearby" strategy was an unexpected result when compared to other studies in the behavioral response literature, which describe whales regularly evading boats (Avila et al., 2015; Parsons, 2012). Hence, this may be a result of the unique environmental factors at play in this study site. Since the Gulf of Tribugá is such a remote area and there is comparatively little boat traffic, whales may not view all boats as a threat, and instead have the rare opportunity to experience a more natural behavioral repertoire. Alternatively, some whales may not be accustomed to being followed, and as a result are more evasive. Whatever the mechanism, this may prove informative to other studies looking at behavioral response to whales in remote locations. This could be especially telling of locations where this dichotomy does not exist.

The four different group compositions that engaged in surface-active behavior may represent a strong reaction to tour boats, a preoccupation with another activity, or both. For example, a calf executing repetitive belly flop behavior would force the accompanying mother (and escort, if present) to remain in the area, near the surface and lingering tour boats. Likewise, a male competitive group may have been directing flipper slap behaviors towards tour boats and/or each other. However, tail slashes were produced by most group compositions (mother-calf-escorts, adults and juveniles, and adult groups; Figure 2), and increased significantly during longer tour boat encounters. At this stage it is difficult to be certain if tail slash behaviors are especially responsive to disturbing stimuli, as suggested by Félix (2004), or if the other behaviors are only rarely elicited out of context. Regardless, this study supports that context may invariably require attention in any research concerning the effect of tour boats on humpback whale behavior.

Limitations

Because researchers were unable to distribute a baseline survey, it is impossible to know the true effect of the educational intervention. Still, because the knowledge-based questions utilized for this study (Table 1) were designed to detect the participants' level of understanding for humpback whale behavior and conservation, knowledge can be assessed regardless of the amount learned from the workshop. Therefore, even though the participants' knowledge may have come from a previous environmental workshop, or another group of researchers, the questionnaire still met its aim in assessing what the stakeholders knew about humpback whale behavior and conservation. In the future, researchers will strive to collect questionnaires some time before and after educational demonstrations with stakeholders.

Although this study achieved saturation, the current population of whale-watching operators was low within this remote region. Our low sample size and rigorous statistical techniques may account for the lack of highly significant statistical correlations between most TPB variables. For this reason, it is important to view this evaluation as a pilot study. As this region continues to develop, additional monitoring is necessary to ensure current regulations and educational interventions are adequate for promoting responsible ecotour operations. This research is the first to attempt to evaluate whale-watching operators' behavior in this region. Therefore, despite these limitations, this research is critical to establishing a baseline for understanding the developing ecotour industry in Colombia. For this reason, we believe that this study should be regarded as a pilot study from which to build more detailed evaluations of whale-watching operations in the Gulf of Tribugá.

Further evaluations of the role of TPB constructs in the formation of a behavioral intention to conduct ecotour operations responsibly are needed to determine whether or not the theory requires additional constructs such as knowledge, as proposed. It is possible that additional constructs, not detected by the present survey, are needed to account for changes between behavioral intentions and actual observed behaviors of whale-watching operators.

The fact that some of the small, informal hotels were not sampled (because they were not advertised, were impossible to contact, and/or not large enough to host a researcher onboard) might have biased the results towards larger hotels and will be considered for future studies. Additionally, since there was little correspondence between the measurement of the whale behavior and boats' approach/ following maneuvers, the researchers cannot claim that the observed whale behaviors were definitely in response to tour boats. Third variables such as social contexts and environmental features were out of the team's control.

Future Directions

As the Colombian whale-watching industry expands, it is imperative that regional human-wildlife interactions continue to be monitored to ensure the long-term sustainability of this growing industry. Through demonstrating that environmental education is an effective tool for the improvement of whale-watching operators' pro-environmental attitudes, future research should focus on the longevity and strength of this established relationship. Additionally, researchers should aim to evaluate behavioral change over the course of the entire whale-watching season, to determine if this change is stable or transitory.

Moving forward, the validity of self-report tests continues to be of high concern in research using questionnaires (Greenwald & Banaji, 1995). This is especially true regarding delicate or divisive topics, and as such, the whale-watching operators may have been affected by a social desirability bias (Gamberini et al.,

2014). Implicit measures are difficult to acquire and thus frequently left out of human dimension research. However, we support previous calls to utilize implicit measures in studies evaluating human attitudes towards wildlife to better assess the mechanisms that drive both attitudinal and behavioral change (Manfredo & Bright, 2008).

Lastly, we have seen that whale-watching operator compliance can be very poor, even with sustainable guidelines in place. Others have suggested using legal ramifications, government enforcement, or social pressure from other whale-watching operators and tourists to increase operator compliance (Parsons, 2012). While we do not disagree with these methods of improved regulation, we seek to add scientific integration to this list. Using whale-watching boats as platforms for marine mammal research has been previously suggested as a method to conduct more and cost-effective water-based research (New et al., 2015). Additionally, whale-watching companies benefit from having an expert attraction onboard (e.g., satisfied passengers, enhanced reputation; New et al., 2015). However, the conservation impact specifically aimed at whale-watching operators was not discussed. Upon our integration with the Colombian ecotours, the operators began actively listening, learning, conversing, answering questions, asking questions, and generally increasing their knowledge base. Due to this sustained relationship, we are interested in further assessing the effect knowledge has on compliance to follow whales at a sustainable distance. A study with a much larger sample size (n = 206) saw similar responses: The desire to protect a non-human animal or species was associated with learning, as well as the desire to know more (Clayton, Fraser, & Saunders, 2009). Over time, we expect that the local population of whale-watching operators will continue to gain knowledge from their prolonged exposure to our research, mutual respect, and information exchanged onboard. The hope is that these perpetual positive interactions will inspire increased compliance to the advised guidelines.

In future studies, the research team hopes to have both an introductory and exit questionnaire to assess any shift in behavioral intention, which may occur as a result of the intervention. This would allow for the improvement of existing interventions aimed at enhancing cetacean-based ecotourism in the region. Additionally, the direct observation of whale-watching operators' behavior both before and after interventions would allow researchers to directly assess behavioral change within the context of the TPB.

Researchers such as Weaver and Sclüter (2010) have predicted low growth in South American ecotourism due to political instability, remoteness, poorly managed natural areas, and other environmental problems. Still, this particular remote South American region has experienced ecotourism growth. As this unlikely and unpredictable industry continues to grow, it is imperative that it be monitored. This preliminary work has provided a baseline from which future studies can compare results, putting future research in perspective.

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References

Acevedo, J., Rasmussen, K., Felix, F., Castro, C., Llano, M., Secchi, E., ... Pastene, L. A. (2007). Migratory destinations of humpback whales from the Magellan Strait feeding ground, Southeast Pacific. *Marine Mammal Science, 23*, 453–463. doi:10.1111/j.1748-7692.2007.00116.x

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*, 179–211. doi:10.1016/0749-5978(91)90020-T

Ajzen, I., Joyce, N., Sheikh, S., & Cote, N. G. (2011). Knowledge and the prediction of behavior: The role of information accuracy in the theory of planned behavior. *Basic and Applied Social Psychology, 33*, 101–117. doi:10.1080/01973533.2011.568834

Arias-Gaviria, D., Muñoz-Vargas, C.A., Avila, I.C. (2011). Guía de avistamiento ballenas jorobadas Colombia. Retrieved from http://www.guiadeballenas.com/. *Minitserio de Industria, Comercio y Turismo, Viceministerio de Turismo, Dirección de Calidad y Desarrollo Sostenible del Turismo, Bogotá, Colombia*.

Avila, I. C., Correa, L. M., Parsons, E. C. M. (2015). Whale-watching activity in Bahia Malaga, on the Pacific coast of Colombia, and its effect on humpback whale (*Megaptera novaeangliae*) behavior. *Tourism in Marine Environments, 11*, 19–32. doi:10.3727/154427315X14398263718394

Bamberg, S. & Möser, G. (2007). Twenty years after Hines, Hungerford, and Tomera: A new analysis of psycho-social determinants of pro-environmental behaviour. *The Journal of Environmental Psychology, 27*, 14–25. doi:10.1016/j.jenvp.2006.12.002

Blamey, R. K. (2010). Principles of ecotourism. In D. B. Weaver (Ed.) *The encyclopedia of ecotourism*. Cambridge, MA: CABI.

Cartwright, R., Gillespie, B., LaBonte, K., Mangold, T., Venema, A., Eden, K., & Sullivan, M. (2012). Between a rock and a hard place: Habitat selection in female-calf humpback whale (*Megaptera novaeangliae*) pairs on the Hawaiian breeding grounds. *PLoS ONE, 7*, e38004. doi:10.1371/journal.pone.0038004

Chen, C. L. (2011). From catching to watching: Moving towards quality assurance of whale/dolphin watching tourism in Taiwan. *Marine Policy, 35*, 10–17. doi:10.1016/j.marpol.2010.07.002

Cheung, S. F., Chan, D. K. S., & Wong, Z. S. Y. (1999). Reexamining the theory of planned behavior in understanding wastepaper recycling. *Environment and Behavior, 31*, 587–612. doi:10.1177/00139169921972254

Chittleborough, R. G. (1958). The breeding cycle of the female humpback whale, *Megaptera nodosa* (Bonnaterre). *Marine and Freshwater Research, 9*, 1–18. doi:10.1071/MF9580001

Cisneros-Montemayor, A. M., Sumaila, U. R., Kaschner, K., & Pauly, D. (2010). The global potential for whale watching. *Marine Policy, 34*, 1273–1278.

Clapham, P. J. (1996). The social and reproductive biology of humpback whales: An ecological perspective. *Mammal Review, 26*, 27–49. doi:10.1111/j.1365-2907.1996.tb00145.x

Clayton, S., Fraser, J., & Saunders, C. D. (2009). Zoo experiences: Conversations, connections, and concern for animals. *Zoo Biology, 28*, 377–397. doi:10.1002/zoo.20186

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). New York, NY: Academic Press.

Corkeron, P. J. (1995). Humpback whales (*Megaptera novaeangliae*) in Hervey Bay, Queensland: behaviour and responses to whale-watching vessels. *Canadian Journal of Zoology, 73*, 1290–1299. doi:10.1139/z95-153

Cunningham, P. A., Huijbens, E. H., & Wearing, S. L. (2012). From whaling to whale watching: Examining sustainability & cultural rhetoric. *Journal of Sustainable Tourism*, 2, 143–161.

Dawbin, W. H. (1966). The seasonal migratory cycle of humpback whales. In K. S. Norris (Ed.), *Whales, dolphins and porpoises* (pp. 145–170). Berkley, CA: University of California Press.

Díaz, J. M. (2002). Golfos y Bahías de Colombia. Libros de la Colección Ecológica del Banco de Occidente. Retrieved from www.imeditores.com/banocc/golfos

Field, A. (2013). *Discovering statistics using IBM SPSS statistics* (4th ed.). London, UK: Sage Publications.

Félix, F. & Haase, B. (2001). The humpback whale off the coast of Ecuador, population parameters and behavior. *Revista de Biología Marina y Oceanografía, 36*, 61–74.

Félix, F. (2004). Assessment of the surface activity in humpback whales during the breeding season. *Latin American Journal of Aquatic Mammals, 3*, 25–36.

Flórez-González, L. (1991). Humpback whales *Megaptera novaeangliae* in the Gorgona Island, Colombian Pacific breeding waters: Population and pod characteristics. *Memoirs of the Queensland Museum, 30*, 291–295.

Galvis, J. & Mojica, J. (1993). Geología. In P. Leyva (Ed.), Colombia Pacífico Tomo I (pp. 80–95). Bogotá, Colombia: Fondo para la protección del medio ambiente "José Celestino Mutis" FEN Colombia.

Gamberini, L., Spagnolli, A., Corradi, N., Satori, G., Ghirardi, V., & Jacucci, G. (2014). Combining implicit and explicit techniques to reveal social desirability bias in electricity conservation of self-reports. *Energy Efficiency, 7*, 923–935. doi:10.1007/s12053-014-9266-6

Gilpin, A. R. (1993). Table for conversion of kendall's tau to spearman's rho within the context of measures of magnitude of effect for meta-analysis. *Education and Psychological Measurement, 53*, 87–92. doi:10.1177/0013164493053001007

Greenwald, A. G., & Banaji, M. R. (1995). Implicit social cognition: attitudes, self-esteem, and stereotypes. *Psychological Review, 102*, 4–27. doi:10.1037//0033-295X.102.1.4

Goh, E., Ritchie, B., & Wang, J. (2017). Non-compliance in national parks: An extension of the theory of planned behaviour model with pro-environmental values. *Tourism Management, 59*, 123–127.

Hoyt, E., & Iñíguez, M. (2008). *The state of whale-watching in Latin America*. Chippenham, UK: Whale and Dolphin Conservation Society, International Fund for Animal Welfare, Global Ocean.

International Whaling Commission. (1998). Report of the scientific committee. Annex G report of the sub-committee on comprehensive assessment of southern hemisphere humpback whales. *Report of the International Whaling Commission, 48*, 170–182.

Jennions, M. D., & Møller, A. P. (2003). A survey of the statistical power of research in behavioral ecology and animal behavior. *Behavioral Ecology, 14*, 438–445. doi:10.1093/beheco/14.3.438

Kline, P. (1999). *The handbook of psychological testing* (2nd ed.). London, UK: Routledge.

Lusseau, D. (2005). Residency pattern of bottlenose dolphins Tursiops spp. in Milford Sound, New Zealand, is related to boat traffic. *Marine Ecology Progress Series*, *295*, 265–272. doi:10.3354/meps295265

Manfredo, M. J., & Bright, A. D. (2008). Attitudes and the study of human dimensions. In M. J. Manfredo (Ed.) *Who cares about wildlife?* (pp. 75–109). Fort Collins, CO: Springer. doi:10.1007/978-0-387-77040-6_4

Miller, L. J., Zeigler-Hill, V., Mellen, J., Koeppel, J., Greer, T., & Kuczaj, S. (2013). Dolphin show and interaction programs: Benefits for conservation education? *Zoo Biology, 32*, 45–53. doi:10.1002/zoo.21016

Mojica-Patiño, J. A. (2015). Llegaron las ballenas al Pacífico colombiano y usted puede ir a verlas. *El Tiempo.* Retrieved from http://www.eltiempo.com/estilo-de-vida/viajar/temporada-de-ballenas-en-el-pacifico-colombiano-2015/16098795

New, L. F., Hall, A. J., Harcourt, R., Kaufman, G., Parsons, E. C. M., Pearson, H. C., Cosentino, A. M., & Schick, R. S. (2015). The modeling and assessment of whale-watching impacts. *Ocean & Coastal Management, 115*, 10–16. doi:10.1016/j.ocecoaman.2015.04.006

Nunnally, J. C. (1978). *Psychometric theory*. New York, NY: McGraw-Hill.

O'Connor, S., Campball, R., Cortez, H., & Knowles, T. (2009). *Whale watching worldwide: Tourism numbers, expenditures and expanding economic benefits.* Yarmouth, MA: International Fund for Animal Welfare.

Oreg, S., & Katz-Gerro, T. (2006). Predicting proenvironmental behavior cross-nationally values, the theory of planned behavior, and value-belief-norm theory. *Environment and Behavior, 38*, 462–483. doi:10.1177/0013916505286012

Parsons, E. C. M. (2012). The negative impacts of whale-watching. *Journal of Marine Biology, 2012*, 1–9. doi:10.1155/2012/807294

Powell, R. B., & Ham, S. H. (2008). Can ecotourism interpretation really lead to pro-conservation knowledge, attitudes and behavior? Evidence from the Galapagos Islands. *Journal of Sustainable Tourism, 16*, 467–489. doi:10.2167/jost797.0

Rasmussen, K., & Palacios, D. M. (2013). Highlights from a decade of humpback whale research in the gulf of Chiriqui, western Panama, 2002-2012. (IWC Scientific Committee Publication No. SC/65a/SH04).

Reilly, S. B., Bannister, J. L., Best, P. B., Brown, M., Brownell Jr., R. L., Butterworth, … Zerbini, A. N. (2008). *Megaptera novaeangliae.* The IUCN Red List of Threatened Species 2008: e.T13006A3405371.

San Norberto, E. M., Taylor, J., Salvador, R., Revilla, A., Merino, B., & Vaquero, C. (2011). The quality of information available on the internet about aortic aneurysm and its endovascular treatment. *Revista Española de Cardiologia, 64(*10), 869–875. doi:10.1016/j.rec.2011.04.011

Scheidat, M., Castro, C., Gonzalez, J., & Williams, R. (2004). Behavioural responses of humpback whales (*Megaptera* Stamation *novaeangliae*) to whale-watching boats near Isla de la Plata Machalilla national park, Ecuador. *Journal of Cetacean Research and Management, 6*, 1–6.

Scheyvens, R. (1999). Ecotourism and the empowerment of local communities. *Tourism Management*, *20*, 245–249.

Schwartz, S. H. (1977). Normative influence on altruism. In L. Berkowitx (Ed.), *Advances in Experimental Social Psychology* (Vol. 10, pp. 221–229). New York, NY: Academic Press.

Turaga, R. M. R., Howarth, R. B., & Borsuk, M. E. (2010). Pro-environmental behavior: Rational choice meets moral motivation. *Annuals of the National Academy of Science, 1185*, 211–224. doi:10.1111/j.1749-6632.2009.05163.x

Turchet, L., Zanotto, D., Minto, S., Roda, A., & Agrawal, S. (2016). Emotion rendering in plantar vibro-tactile simulations of imagined walking styles. *IEEE Transactions on Affective Computing, PP*(99), 1–17. doi: 10.1109/TAFFC.2016.2552515

Turner, J. R., Ecke, L., Briand, L., Haydon, P., & Blendy, J. A. (2013). Cocaine-related behaviors in mice with deficient gliotransmission. *Psychopharmacology (Berl), 226*, 167–176. doi:10.1007/s00213-012-2897-4

Weaver, D. B., & Sclüter, R. (2001). Latin America and the Caribbean. In D. B. Weaver (Ed.), *The encyclopedia of ecotourism* (pp. 173–188). Cambridge, MA: CABI Publishing.

Wilson, C., & Tisdell, C. (2003). Conservation and economic benefits of wildlife-based marine tourism: Sea turtles and whales as case studies. *Human Dimensions of Wildlife: An International Journal*, *8*, 49–58.

Wright, D., London, K., & Field, A. P. (2011). Using bootstrap estimation and plug-in principle for clinical psychology data. *Journal of Experimental Psychopathology, 2*, 252–270. doi:10.5127/jep.013611

Zeppel, H., & Muloin, S. (2008). Conservation benefits of interpretation on marine wildlife tours. *Human Dimensions of Wildlife: An International Journal*, *13*, 280–294.

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