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Influence of Interpretation on Conservation Intentions of Whale Tourists

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Abstract

The concept of interpretation denotes on-site education while people engage in a guided nature-based activity. The literature suggests that interpretation influences conservation intentions but does not reveal whether the effect is constituted by interpretation or by other aspects of the guided activity. This study examined the effect of interpretation on conservation intentions on top of a wildlife viewing tour without interpretation, and differentiated among interpretation contents. In a field experiment among whale watchers, four interpretation conditions were implemented: (1) no interpretation (control group), (2) knowledge content, (3) responsibility content, and (4) emotion content. Whale conservation intentions were measured before and after the whale watching experience. The results indicate that interpretation has an effect on whale conservation intentions. The effect of emotion interpretation was larger than were the effects of knowledge interpretation and responsibility interpretation. Incorporating emotional messages, then, could contribute to successful interpretation in terms of promoting conservation among tourists.

Key words: conservation, emotion, intentions, interpretation, whale watching, wildlife tourism

1 Introduction

Nature-based tourism, ecotourism and wildlife tourism are frequently promoted as activities that can contribute to conservation of natural resources (Ballantyne, Packer, & Hughes, 2009; Ballantyne, Packer, & Falk, 2011; Hughes, 2013). Shaping thought about conservation is an important method to implement this contribution. As success in nature conservation ultimately hinges on public support and involvement (Jacobson, 2009), nature agencies and tourism organizations that foster conservation habitually try to influence tourists in order to promote conservation intentions and behaviors. For example, education programs are designed and implemented to increase understanding and awareness (Christensen, Rowe, & Needham, 2007; Lück, 2003; Orams, 1995).

Indeed, research suggests that environmental education can encourage pro-environmental behavior (Zelezny, 1999). The concept of interpretation refers to a specific form of environmental education, namely on-site education through communication while people engage in a nature-based activity (Christie & Mason, 2003; Moscardo, Woods, & Saltzer, 2004). Interpretation involves information provided by guides or on-site interpreters to a voluntary audience, for example tourists that participate in a guided wildlife viewing tour (Lück, 2003; Orams, 1995; Weiler & Ham, 2001), next to information provided by visitor centers, displays, and brochures (Zeppel & Muloin, 2008). The effects of interpretation have been examined in terms of entertainment provision (Weiler & Ham, 2001), enjoyment and satisfaction (Ham & Weiler, 2007; Hwang, Lee, & Chen, 2005; Powell & Ham, 2008), and participants' knowledge (Hughes & Saunders, 2005; Lück, 2003; Madin & Fenton, 2004; Powell & Ham, 2008; Tubb, 2003).

In addition, a select few studies have addressed the effects of interpretation on conservation intentions. Exploratory research at the Galapagos National Park indicated that interpretation encouraged pro-environmental attitudes and intentions to support conservation (Powell & Ham, 2008). A study among participants in four different wildlife experiences showed a self-reported impact on conservation intentions (Ballantyne et al., 2011). And research among participants of dolphin shows found an increase in conservation intentions, which were measured before and after attending the show (Miller, Zeigler-Hill, Mellen, Koeppel, Greer, & Kuczaj, 2013). Yet, these studies did not intend to isolate the effect of interpretation from the effect of viewing nature and wildlife, as there was no control group (i.e., a group that participated in the activity and that was not exposed to interpretation). In other words, the voyage or experience as a whole, including interpretation, had an effect on conservation intentions, but whether this effect can be attributed to interpretation, cannot be inferred. Furthermore, these studies did not manipulate the interpretation. Therefore, the question whether different interpretation contents have different effects on conservation intentions is yet to be addressed.

The current research examined the effects on conservation intentions of interpretation as additional to viewing nature and wildlife only (without interpretation). Also, the differences of these effects as interpretation content varies were studied. To this end, we carried out a field-experiment. During whale watching tours, the on-board interpretation was manipulated and whale conservation intentions of participating tourists were measured before and after they were exposed to interpretation. A control group of tourists that was not subjected to any form of interpretation was included as well.

1.1 Psychological antecedents of environmental intentions

Research into environmental intentions and behaviors has identified various psychological antecedents that influence intentions. As conservation intentions can be considered a subset of environmental intentions, this literature was useful for contemplating different interpretation contents within our study. Values are often contemplated to explain environmental intentions (e.g., Bardi & Schwartz, 2003; Karp, 1996; Nordlund & Garvill, 2002; Schultz & Zelezny, 1999; Stern & Dietz, 1994). Values are desirable trans-situational goals varying in importance, which serve as guiding principles in the life of a person or other social entity (Rockeach, 1973; Schwartz, 2006). Values are at the basis of the Value-Belief-Norm model (Stern, 2000). This model was often used as a framework to study conservation behavior (Kaiser, Hübner, & Bogner, 2005). Empirical research found that pro-environmental values predict environmental intentions to some extent (e.g. Cameron, Brown, & Chapman, 1998; Karp, 1996; Nordlund & Garvill, 2002).

However, as values transcend specific contexts (Schwartz, 2006), their predictive potential for specific intentions tends to be low (Ajzen, 2005; Manfredo, 2008). Rather, values influence intentions indirectly, mediated by other mental dispositions such as attitudes or norms (De Groot & Steg, 2007). Attitudes are a central concept within the Theory of Planned Behavior (Ajzen, 1991), which is frequently and successfully used as a framework to guide environmental intention studies (Kaiser et al., 2005). Attitudes are mental dispositions to respond favorably or unfavorably to an object or event with some degree (Ajzen, 2005). An attitude toward an object is determined by salient beliefs about that object (Fishbein & Ajzen, 1975). As knowledge might influence these beliefs, new knowledge might influence attitudes (Cottrell & Graefe, 1997; Madden, Allen, & Ajzen, 1992), and, in turn, intentions. A review study suggests that knowledge is often associated with pro-environmental behavior (Zelezny, 1999). However, of the nine studies in this review that were not conducted in classroom

settings, five did not identify a relationship (Zelezny, 1999). In the context of wildlife, knowledge of wildlife and habitats was demonstrated to be associated with attitudes to act towards broad conservation issues (De White & Jacobson, 1994), and knowledge about manatees was found to be related to support for manatee conservation efforts (Ajpanjiguly, Jacobson, & Flamm, 2003). Yet, in general, the relationship between knowledge and behavior change tends to be weak (Fishbein & Ajzen, 1975), if present at all.

Other scholars have emphasized the domain of moral considerations as an important influence on environmentally significant intentions and behaviors (Kaiser et al., 2005). For example, the Norm Activation Model posits that personal norms (feelings of moral obligation to perform or refrain from specific actions) result in pro-social actions (Schwartz & Howard, 1981). Personal norms are activated when someone is aware that one's actions have consequences for others or the environment (awareness of consequences) and when someone feels responsible for these consequences (feelings of responsibility). The Norm Activation Model was effectively applied to explain various environmental intentions or behaviors, such as willingness to pay for environmental protection (Guagnano, 2001; Guagnano, Dietz, & Stern, 1994), or pro-environmental political behavior (Joireman, Lasane, Bennett, Richards, & Solaimani, 2001; Stern, Dietz, Abel, Guagnano, & Kalof, 1999).

Affect and emotions are also assumed to be important antecedents of environmental intentions (Iozzi, 1989; Kals, Schumacher, & Montada, 1999; Kals & Maes, 2002). The term affect refers to the general class of feeling states experienced by humans, and covers the concepts of mood and emotions (Manfredo, 2008). Relative to mood, emotions are about a specific event, have short duration, and usually involve conscious thought (Manfredo, 2008). Affect was found to predict environmental attitudes (Pooley & O'Conner, 2000), and emotional affinity

with nature predicted protective behavior (Kals et al., 1999). Affective dispositions, however, have not been addressed extensively in environmental research (Carrus, Passafaro, & Bonnes, 2008). Researchers have pointed to the need to address emotion in the context of human-wildlife relationships (Jacobs, 2009; Jacobs, Vaske, & Roemer, 2012; Manfredo, 2008). Emotions are hypothesized to drive our attraction to wildlife (Manfredo, 2008) and our motivation to view wildlife (Jacobs, 2009). They were found to inform decisions about wildlife-related behaviors (Slagle, Bruskotter, & Wilson, 2012; Wilson, 2008).

1.3 Hypotheses

To conclude, research has identified various psychological antecedents of environmental intentions, and by extension, wildlife conservation intentions. These factors include values, attitudes, knowledge, norms, awareness of consequences, feelings of responsibility, and affect and emotion. For our study, it was important to select factors that are open to manipulation. As values are formed early in life, and tend to be resistant to change (Jacobs, Vaske, Teel, & Manfredo, 2012), this factor was not feasible for the experiment. For the same reason, norms would be problematic: changing someone's norms is hard to achieve. Yet, manipulating awareness of consequences and feelings of responsibility in order to activate someone's preexisting norms is more likely to be successful (Schwartz & Howard, 1981). In addition, we wanted to represent the major categories of psychological antecedents of conservation intentions, that is, antecedents in the cognitive, the normative, and the affective domains of mental functioning. As attitudes are composed of cognitive and affective aspects (Ajzen, 2005), we did not select this factor. Consequently, knowledge was selected as the factor to represent the cognitive domain. Moreover, traditionally, influencing knowledge has been an important goal of interpretation (Cottrell & Graefe, 1997). To represent the normative domain, we targeted responsibility, as a combination of awareness of consequences and

feelings of responsibility. For the affective domain, emotions toward whales were selected, as emotions are directed to a specific object or event (in contrast to mood, the other subset of affect).

Thus, the knowledge condition focused on conveying factual knowledge about whales, the responsibility condition emphasized how the behavior of individuals might influence whales, and the emotion condition accentuated positive emotions toward whales. We expected the emotion condition to have a larger effect on intentions than the other conditions, because in general the emotional system is the ultimate basis for motivation (Izard, 2009; LeDoux, 1996). Specifically, tourism scholars have correspondingly suggested that especially emotions might have an impact on conservation intentions (Hughes, 2013; Madin & Fenton, 2004; Orams, 1995). In addition, we expected the effect of the responsibility condition to be larger than the effect of the knowledge condition, as the Norm Activation Model suggests (Schwartz & Howard, 1981). Furthermore, research in the context of tourism found that including normative statements in messages increased the willingness to pay a park user fee (Steckenreuter & Wolf, 2013).

Consequently, we advanced the following hypotheses:

- H_1: Interpretation has an effect on conservation intentions.
- H_2: Interpretation focused on responsibility has a larger effect on conservation intentions than interpretation focused on knowledge.
- H_3: Interpretation focused on emotion has a larger effect on conservation intentions than interpretation focused on responsibility.

2 Methods

2.1 Context

We collected data among participants of whale watching tours departing from Las Galletas, in the south west of Tenerife, during February and March 2011. All tours that were included for data collection used the same boat, departed at 10:00 a.m. and lasted three hours. The whale watching spots were located at a quarter of an hour sailing distance from the harbor. The south west of Tenerife is the largest cetaceans observatory in Europe (Hoyt, 2003) and is considered one of the world centers to watch whales in their original habitat (Hoyt, 2003; O'Connor, Campbell, Cortez, & Knowles, 2009).

2.2 Study design

An experimental study design was adopted. As the study was not conducted in a laboratory, but among tourists during whale watching tours, this was a field-experiment. The differences with a laboratory experiment were that not all background variables could be controlled, and that participants were not truly randomly assigned to the conditions. Yet, advantages of field-experiments over laboratory experiments include the study of real-world settings, that add to the ecological validity, and the possibility to keep subjects unaware of being involved in an experiment. The independent factor (i.e., the manipulated variable) was the on-board interpretation content, with the four conditions of (a) no interpretation (control condition), (b) knowledge, (c) responsibility, and (d) emotion. The dependent variables were whale conservation intentions. These were measured on-board, before and after the whale watching experience. Important background variables such as weather, and whales and dolphins spotted, could not be controlled. Instead, trips with similar weather conditions and number and species of whales were matched. Other background variables were controlled for: the same boat, the same route, the same time, and the same crew were used for each trip.

2.3 Factor: interpretation content

No information was provided to the participants subjected to the control condition. The knowledge group was provided with simple factual information about whales. For example, the guide told that pilot whales tend to live in deep waters, tend to live in close family groups of 20 to 100 animals, that they weigh between 1000 and 3000 kg, and that females may live up to 65 years and males up to 45 years. The responsibility group was provided with interpretation that emphasized what effects humans have on whales and how one's individual actions might influence whales. For example, the guide told that some whales species are in danger of becoming extinct, that we owe it to the whales to protect them, and that our behavior as individuals can make a difference. The emotion group was provided with interpretation that aimed to provoke empathy toward whales by anthropomorphizing them (i.e., ascribing human states and traits to whales; Jacobs, 2009). For example, the guide told that the whales around the boat are curious, that they are playing, enjoying, and smiling at the participants, and that they live in families just like humans do. The guide was extensively trained by a researcher to rehearse the pre-composed interpretation stories (see Appendix) before applying them on-board. The guide was instructed to stick closely to the story and the aim of the particular interpretation condition.

2.4 Dependent variables: whale conservation intentions

Three whale conservation intentions were measured: (a) the intention to encourage friends and/or family to help save the whales, (b) the intention to donate an amount of money to a project that protects the whales, and (c) the intention to volunteer a few hours a week with an organization that helps to protect the whales. Responses were coded on a five-point scale (very unlikely, somewhat unlikely, neither likely nor unlikely, somewhat likely, very likely). These measures were included in both a pre-interpretation and a post-interpretation

questionnaire. The pre-interpretation questionnaire also contained questions about demographics, along with a few other questions that were intended to disguise the purpose of the questionnaire (e.g., whether the participants intended to do the trip when they booked their holiday to Tenerife, and whether this was their first whale watching tour). The post-interpretation questionnaire also contained questions about demographics and questions about trip satisfaction. Both questionnaires were available in Dutch, English, French, German, Polish, and Spanish. Back translation of the questionnaires into English indicated no problems with respect to consistency of the questions across languages. The questionnaires could easily be completed within two minutes.

2.5 Data collection procedure

Interpretation conditions were randomly assigned to trips. Participants were tourists who had obtained a ticket for the specific whale watching tour. They were not told about being involved in the field experiment. Ten minutes after the start of the trip (i.e., on-board), the pre-interpretation questionnaire was distributed. This was after the safety instructions were explained, but prior to viewing whales or dolphins and the on-board interpretation. Fifteen minutes before the end of the trip, when returning to the harbor, the post-interpretation questionnaire was distributed. Eighty per cent of the tourists completed both questionnaires.

2.6 Matching

Twenty-five trips were included in data collection phase of the field experiment, until for each interpretation condition, data of at least thirty participants were collected, after matching for a similar amount of whales and dolphins observed and similar weather conditions. Only the data of nine trips that could be matched were used for data analysis (knowledge interpretation was applied to three of these trips, the other three conditions were applied to two trips).

During these nine trips, five or six pilot whales and two to seven bottlenose dolphins were seen. Data of the other sixteen trips were destroyed, because these trips could not be matched (e.g., sudden storm, no whales seen, large amount of whales seen) and hence were not useful for testing the hypotheses.

2.7 Sample

One hundred forty-six participants completed both the pre-interpretation and the post-interpretation questionnaires (43 in the control group [17, 25 per trip], 36 in the knowledge group [8, 11, 17], 34 in the responsibility group [14, 20], and 33 in the emotion group [12, 21]). The mean age was 43 years old (range 15 to 83). Eighty-three participants (57%) were female. Thirty-four participants were inhabitants of the United Kingdom, 21 of Sweden, 20 of Denmark, 16 of Finland, 11 of The Netherlands, 9 of Poland, and 37 came from other countries. For 103 participants (71%), this trip was their first whale watching tour.

2.8 Analyses

Cronbach's alpha was used to determine the internal consistency of the whale conservation intention items. T-tests were conducted to examine the differences between intentions before and after the on-board wildlife viewing experience within each of the four conditions (control, knowledge, responsibility, and emotion). ANOVA was employed to test whether the increases or decreases in intentions (i.e., the difference in intentions before and after interpretation) were different across the four conditions. Regression analyses were applied to examine the influence of pre-interpretation intentions and interpretation content (i.e., knowledge, responsibility, and emotion as dummy variables) on post-interpretation intentions. A *p*-value of .05 was used as a cut-off point for considering differences as statistically significant.

3 Results

3.1 Scale analyses

Cronbach's alpha was .62 for the pre-trip intentions (item-total correlation was .40 for encouraging others, .52 for donating, and .38 for volunteering), and .65 for the post-trip intentions (item-total correlation was .41 for encouraging others, .52 for donating, and .45 for volunteering). These figures do almost, but not fully, fall within the generally accepted range of scale reliability of .65 or larger (Vaske, 2008). Therefore, we included both an intention index (the average of the three intentions) and the individual intentions in our subsequent analyses.

3.2 Differences between intentions before and after interpretation

In the control group, neither the individual intentions, nor the intention index changed significantly after the wildlife viewing experience (Table 1). Yet, the increase of the index was marginally significant ($p = .07$). In the knowledge group, the intention to donate money increased. In the responsibility group, the intentions to encourage others and to volunteer, as well as the overall intention index, increased. Finally, in the emotion group, all individual intentions and the intention index increased. The effect sizes of the increased intentions varied between .37 for the intention to donate money in the knowledge group and .82 for the intention index in the emotion group (Table 1). A Cohen's *d* of .50 is considered a typical relationship, and a *d* of .80 is considered a substantial relationship, and is statistically equivalent to an *r* of .50 (Vaske, 2008).

[TABLE 1 ABOUT HERE]

3.3 Differences across interpretation conditions

The increases (i.e., post-trip minus pre-trip) of the intentions to encourage others and to volunteer did not differ significantly across interpretation conditions (Table 2). The increase of the intention to donate money was significantly larger in the emotion group than in all other groups. The increase of the intention index was significantly larger in the emotion group than in the control group and the knowledge group. The effect sizes were .32 for the intention to donate money and .30 for the intention index. These effect sizes indicate a relationship between typical (η = .243) and substantial (η = .371), and are roughly equivalent to an *r* of .40 (Vaske, 2008).

[TABLE 2 ABOUT HERE]

As an alternative analysis strategy to determine the influence of each interpretation condition, we included pre-interpretation intentions and interpretation conditions (i.e., knowledge, responsibility and emotion as dummy variables) in regression analyses as predictors of post-interpretation intentions (Table 3). Pre-interpretation intentions were statistically significant predictors for all post-interpretation intentions. Knowledge interpretation did not predict any of the post-interpretation intentions, and responsibility interpretation predicted the intention to encourage others. Emotion interpretation predicted the intention to encourage others and to donate money, as well as the intention index. The effect sizes of the three interpretation conditions (the standardized beta's, β in Table 3) are attenuated, because the variables were applied to the whole sample (e.g., the emotion condition was used to predict post-interpretation intentions of all participants, including those that were not exposed to emotion interpretation). Consequently, these effect sizes should not be interpreted in an absolute sense, but relatively to each other. Consistently, the effect sizes of the emotion condition were larger than the effect sizes of the other conditions.

[TABLE 3 ABOUT HERE]

4 Conclusion and discussion

Tourism scholars have emphasized that research is needed into the causal relationships between interpretation programs and conservation intentions (Ballantyne et al., 2009; Hughes, 2013; Moscardo et al., 2004; Zeppel & Muloin, 2008). Previous research has revealed a positive relationship between interpretation and conservation intentions in wildlife tourism contexts (Ballantyne et al., 2011; Miller et al., 2013; Powell & Ham, 2008). Yet, these studies were not conclusive about the causal quality of this relationship. As the studies were correlational, the research designs did not rule out the possibility that observed increases in conservation intentions were not brought about by interpretation exclusively but by other features of the touristic wildlife experience as well. The present experimental study was catered to seek evidence for a causal relationship. Our results suggest that interpretation indeed has a causal effect on whale conservation intentions. One or more intentions increased in the interpretation groups, while none of the intentions increased in the control group. Although the increase of the conservation intention index was marginally significant in the control group, the increases in the other groups were larger.

Furthermore, this study differentiated the effects of interpretation contents. Interpretation that focused on emotion had a larger effect on conservation intentions than the other interpretation conditions did. Specifically, in the emotion group, all intentions increased, while in the responsibility group two intentions increased (encourage others and volunteer) and in the knowledge group one intention increased (donate money). The increase of the intention to donate money was larger in the emotion group than in the three other groups, and the increase

of the intention index was larger in the emotion group than in the control group and the knowledge group. Moreover, emotion interpretation predicted all post-interpretation intentions except the intention to volunteer, responsibility interpretation predicted the intention to encourage others, and knowledge interpretation predicted none of the intentions.

Our findings corroborate the postulation that emotions are important for intention formation in the domain of human-environment interactions in general (Iozzi, 1989; Kals et al., 1999; Kals & Maes, 2002), as well as within the context of wildlife (Jacobs et al., 2012; Manfredo, 2008), and within the more specific context of wildlife tourism (Hughes, 2013; Madin & Fenton, 2004; Orams, 1995). In general, emotions are powerful and central to the mind (Dolan, 2002; Jacobs, 2012). Emotions influence motivation (Izard, 2009), attention (Öhman, Flykt, & Esteves, 2001), perception (Dolan, 2002), and memory formation (Talarico & Rubin, 2003). All of these processes might have contributed to the influence of emotional content on whale conservation intentions in our experiment.

4.1 Study limitations and future research

As this study measured post-interpretation intentions at the end of the whale watching trip, only short-term intention changes were addressed empirically. These do not necessarily translate into behaviors. Firstly, short-term intentions may fade away. For example, a study among visitors of dolphin shows found that conservation intentions increased after the show but returned to base level after three months (Miller et al., 2013). Secondly, intentions do not always translate into actual behaviors (Hughes, 2013). Actions may be harder than anticipated, people might not be supported enough through the behavior change process, or constraints may play a role (Hughes, 2013). Nevertheless, long-term intentions start as short-term intentions, and might translate into behavior. Additional measures, such as follow-up

information provision and guidance how to perform intended behavior, might increase the likelihood that conservation intentions persist and influence behavior over time.

It is highly likely that the observed findings translate to real-world situations, as the field-experiment was conducted in a real-world setting, with actual whale watching tours and actual tourists (who were unaware of their participation in the experiment). In other words, the ecological validity was a strength of this study. The other side of the coin, however, is that the internal validity (i.e., the certainty that a change in the manipulated variable caused a change in the dependent variable) does not necessarily equal the internal validity of a laboratory experiment. While we tried to rule out potential confounds as much as possible by keeping circumstances constant (same boat, same crew, same trip, same time) and matching for other factors (whales seen and weather), it is impossible to be completely confident that confounds were absent.

Future research could implement a similar approach into a laboratory experiment. For example, participants might see a whale documentary with different commentaries for the different conditions. In this design, other factors can be controlled for, and participants can be randomly assigned to conditions. A laboratory experiment could also include a manipulation check, which was not performed in the current study. Including a manipulation check would have implied the inclusion of multiple similar questions (that tap into knowledge about whales, responsibility toward whales, and emotions toward whales) in the pre-interpretation and post-interpretation questionnaires. Much lengthier questionnaires with many duplicate questions could compromise the advantage of participants not being aware of being involved in the experiment. In addition, it would have increased the likelihood of participants not completing the pre-interpretation questionnaire before the whales were seen. Thus, we

deemed the disadvantages of a check more important that the advantage. In a laboratory setting, however, these disadvantages would be absent, as subjects are typically aware of participating in an experiment, and lengthier questionnaires are not necessarily problematic. The absence of a manipulation check in the current research has implications for the detailed interpretation of the findings. While we differentiated the effects of knowledge, responsibility and emotion interpretation conditions, we cannot guarantee that each of these conditions affected nothing but the targeted variables. As an example, the responsibility condition might have evoked some emotions toward whales.

Two sources of increased chance of Type I error (i.e., concluding that there is a relationship between variables while in fact there is no relationship in the population) are relevant to our study. One source pertains to the sample size in combination with the effect sizes. Ideally, the sample size for minimal to typical effect sizes in *t*-tests should be 393 or more (minimal effect) or 64 or more (typical effect) (Cohen, 1992). Similarly, the ideal sample size for minimal effect sizes in four group ANOVAs should be 274 or more (Cohen, 1992). As we were allowed to use the boat during one month for data collection, our sample size was limited for practical reasons. A larger sample for the proposed laboratory experiment could eliminate this source. The other source of increased Type I error relates to the simultaneous analyses for the individual intentions. The Bonferroni correction is often applied to eliminate this source (Vaske, 2008). This correction implies dividing the alpha level (i.e., the cut-off point for deciding that the *p*-value flags a statistically significant relationship) by the number of simultaneous analyses. In this study, the correction would translate into an alpha level of .167 (i.e., .05/3). Thus, the figures pertaining to analyses with individual intentions with *p*-values between .02 and .05 are susceptible to increased Type I error. This source of Type I error does not pertain to any analyses with the intention index. To conclude, some of the

individual figures should be considered with care from the perspective of statistical rigour. Yet, the overall pattern of the findings (i.e., interpretation has an effect, the effect of the emotion condition is larger than the effect of the responsibility condition, and the effect of the responsibility condition is larger than the effect of the knowledge condition) is less susceptible to Type I error, as the pattern is similar across analysis strategies and confirmed by the analyses that used the index (an indicator that is more robust than the individual intentions).

The current study did not address potential interactions between interpretation contents. Consequently, we do not know how combining different conditions into interpretation messages would influence the effects on whale conservation intentions. For example, adding knowledge to the emotion condition could potentially suppress the effect of emotion, could have an additional effect, or could not interact with emotion. Future research could study these interactions.

Whales are charismatic species to many, and therefore our findings do not necessarily apply to other (less charismatic) species. Yet, we expect similar effects to occur in different contexts for two reasons. First, the relationship (but not necessarily a causal one) between interpretation and conservation intentions was demonstrated in different contexts. Combined with the finding of this study that interpretation can cause changes in conservation intentions, it is probable that the observed relationship in previous research flagged a causal relationship as well. Second, our finding that just experiencing whales did not (or only marginally) influence conservation intentions indicates that it is the story and not the animals (regardless of the charismatic features) that constituted the conservation intention changes. Yet, future research could determine whether our reasoning rings true.

Typically, the number of variables in experimental research designs is limited. Correlational studies, in contrast, can address a larger number of variables. Future correlational studies into conservation intentions and behaviors could use existing explanatory models that are composed of several concepts. The Norm Activation Model (Schwartz & Howard, 1981) or the Theory of Planned Behavior (Ajzen, 2005) could be used to explain relationships between interpretation and intentions.

4.2 Management implications

Our study indicates that interpretation efforts to stimulate conservation intentions can be successful. Individuals can contribute to conservation in various ways. For example, people might vote for political parties that foster conservation, donate money to conservation agencies, or engage with behaviors that contribute to conservation, such as waste recycling to reduce pollution impacts on oceans (Harms, 2011). Thus, influencing conservation intentions can be an important means how nature-based tourism, ecotourism and wildlife tourism can contribute to conservation. Tourism and natural resource managers could especially stimulate emotions toward wildlife, as this is probably more effective in fostering conservation intentions than transferring knowledge or emphasizing responsibility only. Yet, the various psychological factors that constitute conservation intentions (attitudes, knowledge, norms, awareness of consequences, feelings of responsibility, and affect and emotion), might interact in complex ways. For the purpose of an experimental research design, it was crucial to isolate factors. In practice, however, there is no need to focus interpretation on one factor exclusively. Interpretation that arouses the affective, the normative, and the cognitive domains of the mind simultaneously might generate a larger effect. Yet, this is a question for future

research. Neglecting emotion in the design of interpretation is in any case not recommendable.

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Table 1 T-tests of whale conservation intentions before and after interpretation

Interpretation condition						Effect size
	Intention[1]	Pre-interpretation[1]	Post-interpretation[1]	Difference	*t*-value	*p*-value	(Cohen's *d*)
Control group						
	Intention index	.01	.10	.09	1.86	.07	.30
	Encourage others	.58	.63	.05	.57	.57	.09
	Donate money	.27	.37	.10	1.67	.10	.26
	Volunteer	-.95	-.87	.08	1.36	.18	.22
Knowledge						
	Intention index	-.10	.03	.13	1.90	.07	.32
	Encourage others	.89	.97	.08	.71	.45	.12
	Donate money	-.14	.03	.17	2.24	.03	.37
	Volunteer	-1.06	-.92	.14	1.71	.09	.29
Responsibility						
	Intention index	-.02	.17	.19	2.68	.01	.47
	Encourage others	.85	1.12	.27	2.50	.02	.44
	Donate money	.15	.33	.18	1.98	.06	.34
	Volunteer	-1.06	-.88	.18	2.24	.03	.38
Emotion						
	Intention index	-.15	.28	.43	4.71	<.01	.82
	Encourage others	.67	1.09	.42	2.81	<.01	.49
	Donate money	-.22	.38	.59	3.84	<.01	.68
	Volunteer	-.91	-.64	.27	2.73	.01	.48

[1]Coded on a 5-point scale from -2 (very unlikely) to +2 (very likely) with 0 as a neutral point.

Table 2 Analyses of variance of increases of whale conservation intentions across interpretation conditions

	Interpretation condition[1]						Effect size
Intention	Control group	Knowledge	Responsibility	Emotion	*F*-value	*p*-value	(η)
Intention index	.09[a]	.13[a]	.19[ab]	.43[b]	4.79	<.01	.30
Encourage others	.05[a]	.08[a]	.27[a]	.42[a]	2.40	.07	.22
Donate money	.10[a]	.17[a]	.18[a]	.59[b]	5.22	<.01	.32
Volunteer	.08[a]	.14[a]	.18[a]	.27[a]	1.04	.38	.15

[1] Means with different superscripts are statistically different on the basis of Tukey HSD.

Table 3 Regression analyses with pre-interpretation intentions and interpretation conditions as predictors for post-interpretation intentions

	Pre-interpretation intention		Knowledge		Responsibility		Emotion		*Adjusted*
Post-interpretation intention	β	*p*-value	β	*p*-value	β	*p*-value	β	*p*-value	R^2
Intention index	.87	<.01	.01	.77	.05	.30	.17	<.01	.76
Encourage others	.78	<.01	.06	.34	.13	.03	.17	<.01	.63
Donate money	.88	<.01	.01	.78	.03	.58	.17	<.01	.75
Volunteer	.91	<.01	.02	.62	.03	.41	.07	.08	.82

Appendix: Interpretation stories

Knowledge condition

We are now on our way to find some whales and dolphins. We have about 250 resident pilot whales here. Pilot whales belong to the same family as dolphins, called the Delphinidae. And just to let you know, every dolphin is a whale, but every whale is not a dolphin. It can be quite confusing, but both whales and dolphins belong to one family, which is also called cetaceans. The whale family is further divided into two distinct suborders. You have the toothed whales, to which the pilot whales and other dolphins belong to. Also the Orca belongs to this family. And then there are baleen whales ladies and gentleman. These whales are the big whales like the famous humpback whale or the blue whale, which is the largest animal in this world and to have ever existed. It can grow up to 33 meters long and it is bigger than any dinosaur to have ever lived.

Right here you can see pilot whales. Pilot whales tend to live in deep waters and the area where you are now is very deep, up to 3.000 meters. The name of the pilot whale comes from the idea that the pod has one leader. They tend to live in close family groups of 20 to 100 animals and can weigh between the 1000 and 3000 kg. These whales tend to separate themselves into pods according to age and sex, accompanied by one dominant bull. Females have a length in between 3.7m and 5.5m, the male pilot whale can reach a length up to 7.3m. The life span of a male pilot whale is about 45 years while females may live up to about 65 years old. Reason for this is that it is the males are the ones that provide the food for their pod. They live on fish and giant squid. For that reason, they go down very deep, up to 700 meters, where the giant squid resides. These squid can be up to 18 meters, which is about two to three times the size of an adult male pilot whales. It is understandable that the male pilot whales can easily be identified in the waters due to the many scars it has on their body, caused by the

tentacles of the giant squid they fight with. As the whales can stay underwater for up to 30 minutes, their hunting for food can be quite a challenge. They are very fast and are compared to cheetahs. They are considered to be the greatest athletes of the deep-diving mammals, with diving speeds being recorded of up to 9 meters a second. They have also been recorded to keep up their sprint for 200m before either catching the squid or giving up the chase.

Responsibility condition

Ladies and gentlemen, what you are about to observe here are pilot whales. We have about 250 resident pilot whales here. The pilot whales belong to the smaller species of whales. We have seen many great species of whales here as well, like the fin whale and the blue whale, which is the biggest animals ever. However, throughout the years this amount has declined as they are now endangered. Out of the 13 great whale species, there are 7 of them endangered. And honestly, we are responsible for that. Only recently an entire species has gone extinct because of us humans and in the next forty years, we will lose 37 per cent more of species on our planet and this is the fault of us humans, unless we, as an individual, act now. We need to watch the wellbeing of whales in order to preserve them. We owe it to them as they suffer in their environment by poisons dumped into the ocean. The greatest threat that the whales are facing nowadays is not necessarily whaling. It is the increase of pollution by us humans. Because when we pollute our environment with these chemicals, from all sorts of products, these chemicals have been linked with a decline in whale populations. Are you aware of the Great Pacific Garbage Patch? This is a patch of 3,5 million ton of plastic in the Pacific, twice the size of Texas now which contains six times more plastic than plankton. Whales and fish eat this. We, as an individual, can help save the whales by already doing something small in our everyday life. Purchasing environmentally-safe products and recycling are very small, but

important steps you can take as an individual as this prevents harmful materials like plastic from entering the water supplies.

It is hard to believe that both whales and dolphins are being caught in fishing nets in many places in the world. We owe it to them and to humankind to watch the whales' well-being because, we need a healthy ocean to survive. Do you know where most of the oxygen we take in comes from? It comes from the oceans. But due to ocean acidification and pollution, this is having a major effect on whales and dolphins. The ocean can revive itself but we must be good custodians to help maintain it. If you are someone who feels responsible for the planet that we all inhabit and cares about wildlife, then you probably would like to save these whales. These whales have inhabited earth long before the development of human beings and it is our intrusion into the ocean ecosystem that causes all sorts of hazards to them, and to ourselves. You do not need money or a degree in marine biology to make a real difference in protecting endangered species. By making small, everyday choices or by educating friends and young people about the amazing qualities of whales, you can truly help to protect them.

Emotion condition

We are now on our way to find some whales and dolphins. We have about 250 resident pilot whales here. The family structures of whales are very fascinating as they resemble our own families. They are particularly intelligent mammals and, like us, they place a lot of value on their families and the role that each member plays within the unit. Just as us, these families exist of grandmothers, mothers, children and babies. It is very important that a family sticks together as they are very social animals and they look after one another. We once saw a pod of whales carrying and guarding a dead calf for a few weeks. It was such a sad experience to witness. Their unspoken cooperation with each and every member within their family shows their sense of responsibility. One reason for them having to stick together is that whale calves

do not mature as quickly as some other mammals do, they require time to grow and develop within a protected environment. When the older mothers stop having children , they act as midwifes by helping their children to nurse their grandchildren. For example, they assist in making sure that the new-borns reach the surface of the water for air. I tend to mirror myself to them as my grandmother always came over to my house to visit my parents and she looked after me a lot when I was younger. They are very smart animals as well. We see calves approaching the boats many times out of curiosity and the mother is usually quite okay with that. It is so cute to see these little whales curiously approaching us and looking at us with their little eyes. You can see them thinking. It is another story when the grand mother is on an outing with her grandchild as she is more protective of her and tends to stay in between the boat and the calf when babysitting. You can see the little one trying to come close to us while she gets fended off by her grandma, who makes sure she can return her grandchild to the family without any harm done. We tend to think she has the kid on a leash, ensuring that these calves are isolated from the dangers of the deep as well as from us. The males hunt during the night in order to maintain their family. This is also why they can age up to 45 years old in the wild, while females can live up to 65 years old.

Wow look at this! This is quite special and we are extremely happy with who is here as the mother you are observing at this moment is called Trompa ladies and gentleman and she is in charge of the whole pod. It is actually amazing to see her again as we had not seen her in such a long time. Trompa is a very curious whale and very fond of seeing us every time. She is the caretaker of this family and she has been one of the long term resident whales here. Because we did not see her for a long time, we feared that something bad might have happened to her. As it happens with a lot of them, they tend to be very curious and we therefore believed she might have been caught in a fishing net and had drowned. But thankfully she is back. This is such a relief for us and her family as they would have felt her loss immensely. She truly is a

beautiful specimen. Look how elegantly she looks in her natural environment! At the moment they are enjoying their time with us, playing around. And look, she is looking at us right now, smiling at us. You can see how happy she is to be surrounded by her family again. We are very happy to see she is unharmed.