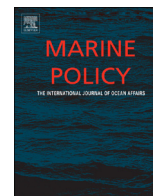




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# Social science as a vehicle to improve dolphin-swim tour operation compliance?



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## ABSTRACT

This study investigates whether tourists can be a force to evoke compliance, via conducting social science and compliance studies simultaneously. Tourist demographics, motivation, biocentrism, knowledge and satisfaction levels were obtained from 511 questionnaires collected from dolphin-swim tourists between 2011 and 2013. Simultaneously dolphin-swim tour operator's compliance to regulations was assessed via 282 surveys collected from 1998 to 2013. Of the 8 dolphin-swim regulations assessed, tour operators demonstrated satisfactory compliance to 2 of the regulations. Conversely, tourists were happy to comply with regulations as they don't want to have a negative impact on the targeted species. The importance of understanding the human dimensions of dolphin tourism for the successful management of the industry is highlighted, as it enables interpretation to be developed that increases tourists education and biocentric levels. Tourists can be used as a vehicle for increasing tour operator compliance, enabling the industry to become more sustainable, whilst simultaneously encouraging economic growth.

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## 1. Introduction

Cetacean-based tourism is defined as any tourist activity with the primary purpose of watching or swimming-with cetacea (whales and dolphins) and is one of the fastest growing industries in the world [1]. Cetacean-based tourism generated over US\$2.1 billion in revenue worldwide in 2008 [2], making it the largest current economic activity dependent upon cetaceans [3]. In Australia, income derived from cetacean-based tourism has risen substantially, with a growth of 8.3% in the last decade [2,4]. In 2008, more than 1.6 million tourists participated in cetacean-based tourism in Australia, and the industry is now worth over \$29 million to the Australian economy [2,5]. However, the rapid expansion of this industry has raised concerns over the impacts these operations have on the targeted species, the marine environment and the sustainability of this tourism industry [6]. Long-term studies indicate that short-term behavioural changes and avoidance tactics may have long-term consequences (e.g., decreased reproductive success [7] and increased mortality rates [8,9]) for individuals and their populations [10].

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In order to counteract the negative impacts of cetacean-based tourism, tours have the potential to positively influence participant's experiences and perceptions of the targeted species and their environment to facilitate responsible environmental behaviour amongst participants [11–13]. Research indicates that cetacean tourism interpretation that is carefully designed and delivered, can effectively increase visitor knowledge, influence attitudes, encourage behaviour modification, and contribute to a rewarding touristic experience [1,14–18]. However, limited research focuses on the human dimensions of dolphin tourism and its potential to increase tourist's biocentric values and pro-conservation behaviours [15,19,20]. Indeed, this is the first study to evaluate whether there are long-term increases in participation biocentrism due to participation in a dolphin-swim tour. The research also evaluates factors that can promote education and what type of information is desired by tourists.

Interpretation not only helps protect the environment but can also increase visitor enjoyment and lead to longer-term benefits in participants, such as greater environmental awareness and involvement in conservation organisations (e.g., [1,15,19,21,]). It has been suggested that interpretation on-board vessels has the potential to help protect cetaceans via changes in tourist's behaviour, and may be more important than regulations in ensuring long-term environmentally conscious and sustainable practices [16,22,23]. Dolphin-swim tourism compliance is negligible globally [24–26], with the industry in PPB historically non-compliant

due to failed management [27,28]. Non-compliance is driven by the pressure faced by tour operators to satisfy customers and meet expectations [24] and facilitated via a lack of enforcement [28]. In the absence of government enforcement, the question remains: how can tour operators be encouraged to comply to regulations so that the industry remains sustainable? If tour operators are informed about what their patrons want, and this is aligned with sustainable practice, then there is the potential for tourists to be used as a force to drive tour operator compliance. Irrespective that the dolphin-swim industry can be governed by regulations, levels of compliance can be low. Therefore, alternative strategies are required to improve compliance and mitigate impacts that dolphin-swim industries may pose to target species. In other sectors, social science questionnaires have determined that individuals are willing to pay more for environmentally friendly products, and that good eco-performance generates competitive advantages, such as increased word of mouth intention [29–31].

This manuscript explores whether tourists themselves can evoke compliance, via conducting social science and compliance studies simultaneously. The objectives of this paper were to investigate whether social sciences (specifically customer questionnaires) can provide the opportunity to encourage tour operator compliance. Specifically, this study aimed to evaluate dolphin-swim participant's demographics, motivation, biocentrism, knowledge and satisfaction levels before, after and 6 months post a dolphin-swim tour. Finally, this study aimed to compare compliance across two time frames to determine whether stricter and simpler amendments in the regulatory requirements motivated tour operations to improve compliance levels.

## 2. Methods

### 2.1. Study site

Port Phillip Bay (hereafter PPB) is home to approximately 120 individual dolphins, recently identified as a genetically and morphologically isolated sub-species of bottlenose dolphin; the Burrunan dolphin (*Tursiops australis*) [32]. To interact with Burrunan dolphins, tourists on-board dolphin-swim tour vessels engage in a 3.5 h tour of the southern end of PPB (38°05'S, 144°50'E), on the south-eastern coast of Victoria, Australia.

### 2.2. Questionnaire design

Questionnaires were designed around six core components: factors that motivate tourists to participate in a dolphin-swim tour; participant's biocentric values; participant's level of conservation activity; participant's perceived knowledge about dolphins, participant's interest levels on topics about dolphins and their environment; and participant's satisfaction with the dolphin-swim tour. Questionnaires were voluntary and only distributed to participants over the age of 18. The experimental design employed a number of scaled items (previously tested in other marine wildlife encounter programs, e.g., [5,16,33–35]). Closed-response questions were rated using 5-point Likert-type scales, which enabled participants to respond to a range of variables related to their experience, biocentric values, and their knowledge about dolphins and their environment. A 75% questionnaire completion rate was required to be included within the study.

Questionnaires were distributed to dolphin-swim tourists: pre dolphin-swim (hereafter PRE) (completed one week or less prior to dolphin-swim tour); post dolphin-swim (henceforth POST) (completed within a day of participation); and 6 months post dolphin-swim (hereafter 6 MP) (completed 6 months or more after the dolphin-swim tour). Questionnaires were accessible

online, through the survey monkey website. PRE- and POST questionnaires were distributed to dolphin-swim tourists via a link embedded into an email from the dolphin-swim companies. 6 MP questionnaires were distributed by the primary researcher (NF) via email to tourists who had participated in either of the first two questionnaires. NF was on-board dolphin-swim tours to encourage participation and answer any questions.

### 2.3. Compliance data collection

Observations of tour operator compliance to regulations were conducted on-board dolphin-swim tour vessels in PPB across two time frames (period 1: 2007–2008; and period 2: 2011–2013). Data was recorded for distance between tour vessels, repositioning of tour vessels during a dolphin-swim, interactions with dolphin groups within Ticonderoga Bay Sanctuary Zone (TBSZ), and number of swimmers, using 1 min scan samples [36]. TBSZ is a small (approx. 2000 m<sup>2</sup>) sanctuary zone inside PPB [37], extending 250 m offshore from Point Nepean (38°17'56.9"S, 144°38'54.8"E; 38°18'5"S, 144°38'54.8"E) to Police Point (38°18'46.8"S, 144°42'19.6"E; 38°18'56.6"S, 144°42'19.6"E) [38]. Continuous observations were used to record approach type (Table 2), number of approaches and whether education was provided. An encounter was defined as the period during which a dolphin-swim vessel was engaged in interaction with a dolphin group (within 300 m), as described in Scarpaci et al. [27]. Distance was determined using a Yardage Pro 500 range finder. As stated in the Wildlife (Marine Mammal) Regulations [38], a calf was defined as any individual that was less than half the length of an adult female. Tour operator compliance to the Wildlife (Maine Mammal) Regulations [38] was assessed for the conditions listed in Table 1, with compliance deemed satisfactory if 80% or higher [25,27,28].

### 2.4. Statistical analyses

Participant's biocentrism, satisfaction, interest and motivation were based on an indicator value, calculated as the mean response to statements on the Likert-type questions. Scores of 1–2.9 were considered non-biocentric, 3–3.9 represented a neutral attitude, and scores of 4–5 were deemed biocentric [11]. Scores from PRE, POST and 6 MP questionnaires were compared using Mann Whitney U tests to determine if biocentrism, satisfaction, interest and motivation varied between time frames [39]. Results were considered significant at  $p \leq 0.05$ .

A modified four-item New Environmental Paradigm (NEP) scale was utilised, as designed by Luzar et al. [40]. The NEP was used to assess participant's biocentric values regarding conservation of the marine environment, and participant's biocentric values in terms of motivation and intent to become involved in marine conservation. Each answer received a value from 1 to 5, and participants with scores of 3–3.9 were deemed to have neutral biocentric values, scores of less than 2.9 represented negative biocentric values, and scores of 4–5 represented positive biocentric values.

## 3. Results

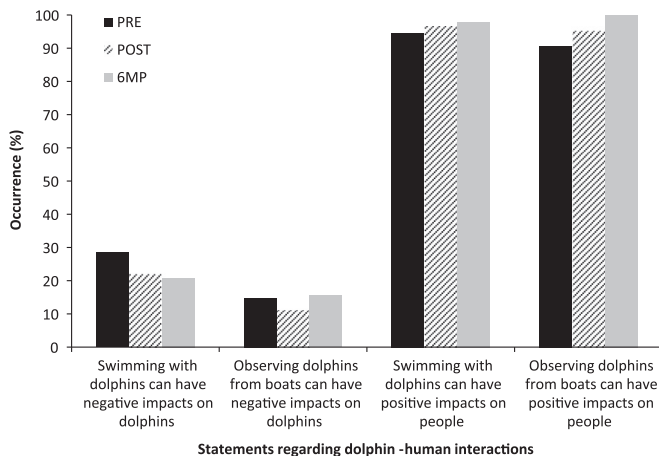
Questionnaires were conducted from February 2011–October 2013. The response rate was 5.7% ( $n=511$ ), accounting for 40.1% ( $n=205$ ), 41.1% ( $n=210$ ) and 18.8% ( $n=96$ ) for PRE, POST and 6 MP, respectively. Participants were most likely to complete POST and 6 MP questionnaires (11.7%,  $n=49$ ) followed by PRE and 6 MP questionnaires (7.6%,  $n=32$ ) and PRE and POST questionnaires (2.6%,  $n=11$ ). Less than 1% (0.7%,  $n=3$ ) of participants completed all 3 questionnaires.

**Table 1**  
Definitions of conditions stipulated in the wildlife (marine mammal) regulations [38] that were assessed.

| Condition   | Regulations         | How compliance was assessed  |
|---|---------------------|--|
| 1. Do not approach a dolphin head-on, or cut in front of a dolphin's path   | Part 3, 9(1a, b, c) | When a tour vessel was within 100 m of a dolphin group and moved in a steady direction towards the group it was deemed an approach. Three approach types were observed (Table 2)   |
| 2. Tour vessel must not approach a dolphin group closer than 100 m more than 5 times each tour  | Part 5, 17(5)       | Number of approaches tour vessels undertook per trip recorded  |
| 3. Must ensure that a tour vessel does not approach within 300 m of another tour vessel when they are within 100 m of a dolphin group | Part 3, 9(4)        | Distance between tour vessels assessed when vessels were within 100 m of a dolphin group and another tour vessel was within 300 m  |
| 4. Must not swim with a calf  | Part 5, 17(15)      | Observer considered crew had opportunity to observe presence of a calf prior to a swim (i.e., calf was clearly visible to observers unaided eye, or staff indicated to customers that a calf was present)                |
| 5. Tour operators must not approach a dolphin within 200 m whilst in TBSZ   | Part 5, 16(12)      | Distance between tour vessels and dolphins recorded when tour vessels within TBSZ  |
| 6. Must not reposition a tour vessel during a dolphin-swim  | Part 5, 17(11)      | Recorded any manoeuvring of tour vessel during a dolphin-swim that was not motivated by safety concerns  |
| 7. Must ensure that no more than 10 people participate in a dolphin-swim  | Part 5, 17(14)      | Number of swimmers (within 300 m of dolphins) recorded every minute until conclusion of dolphin-swim   |
| 8. Tour operators must provide information on the biology and conservation status of and threats facing dolphins                      | Part 5, 16(2)       | Recorded whether staff provided information on dolphins during tour. If staff provided information on species name, home range and threats facing the dolphins in PPB they were deemed to be compliant to this condition |

**Table 2**  
Definitions of approach types used by tour operators in PPB, Victoria (modified from Scarpaci et al. [27]).

| Approach type     | Definition   | Legality |
|-------------------|--|----------|
| Parallel approach | Tour vessel positioned to either side of a group of dolphins   | Legal    |
| Direct approach   | Tour vessel positioned directly into the middle of a group of dolphins                                     | Illegal  |
| J approach        | Tour vessel initially travelled parallel to a dolphin group, but then moved directly in front of the group | Illegal  |



**Fig. 1.** Participant's views on dolphin-swimming (agree and strongly agree).

### 3.1. Demographics

Respondents were primarily from Victoria, Australia (85.0%,  $n=182$ ), followed by international travellers (8.9%,  $n=19$ ) and travellers from other states of Australia (6.1%;  $n=13$ ). The international composition of travellers varied (Europe=3.4%; UK=2.8%; USA/Canada=1.9% and Asia=0.9%). Majority of respondents were female (69.3%,  $n=142$ ), while males accounted for 30.7% ( $n=63$ ). Age of respondents ranged from 18 to 71 years old (mean=39,  $SE=0.893$ ). Respondents were generally well educated with 75.7% ( $n=155$ ) of participants post-secondary qualified and of these, 62.5% ( $n=128$ ) qualified to tertiary standards. The intent of participants was to swim with free-ranging dolphins (94.7%,  $n=195$ ). Respondents independently organised and travelled to the dolphin-swim tour site. The majority (73.2%,  $n=150$ ) of respondents had not previously fed, swam with or interacted with dolphins in other locations. For the majority of

patrons, this was their first encounter with dolphins in PPB (89.8%;  $n=184$ ). Almost all participants felt that swimming with dolphins was beneficial for them and posed no impact on the dolphins (Fig. 1). The potential impact of swimming with, and observing dolphins from boats, was further disregarded by participants across time, although this was not significant,  $H(2)=3.106$ ,  $p=0.212$  and  $H(2)=0.053$ ,  $p=0.974$ , respectively.

The majority of participants did not frequently engage in environmental activities, with almost half (49.7%,  $n=94$ ) of participants having never participated in conservation activities and 43.9% ( $n=83$ ) having never made a monetary donation to an environmental cause. Most participants had visited an aquarium or zoo at least once (41.7%,  $n=79$  and 45.0%,  $n=85$ , respectively), and approximately 80% of participants had watched a marine documentary on dolphins.

### 3.2. Visitor motivation factors

Prior to the dolphin-swim trip, factors that motivated tourists to select a tour boat company were: activities offered (75.6%,  $n=155$ ); environmental beliefs and company awards (61.5%,  $n=126$ ); and cost (60.5%,  $n=124$ ). Participants were not motivated to select a tour boat company based on: dolphin sighting guarantee (26.3%,  $n=54$ ); size of boat (24.4%,  $n=50$ ); or number of people (44.9%,  $n=92$ ). There was a significant difference ( $t(4)=4.168$ ,  $p=0.014$ ) between factors that participants ranked as important and those not considered as important.

Irrespective of the time frame, factors important to participants do not change (i.e., POST and 6MP tour the most important factors when participating in a dolphin-swim were still: seeing dolphins in their natural environment; knowledgeable staff; and opportunities to see dolphins) (Table 3). Tourists were motivated to partake in a dolphin-swim tour more for the dolphin experience (94.7%) than for the overall environment experience (78.3%). Getting close to dolphins was not of high importance when participating in a dolphin-swim, and

**Table 3**

Factors of very-high importance to participants when participating in a dolphin-swim (PRE, POST and 6 MP).

|  | Category           | PRE (%) | POST (%) | 6 MP (%) |
|--|--------------------|---------|----------|----------|
| Large numbers of dolphins to see             | Dolphin experience | 45.5    | 30.9     | 20.0     |
| Getting close to dolphins                    | Dolphin experience | 68.2    | 63.3     | 44.2     |
| Opportunity to see dolphins                  | Dolphin experience | 92.6    | 87.7     | 89.5     |
| Seeing dolphins in their natural environment | Dolphin experience | 94.7    | 93.3     | 92.7     |
| Interesting information about dolphins       | Knowledge          | 80.4    | 75.2     | 87.3     |
| Knowledgeable staff                          | Knowledge          | 94.2    | 89.5     | 94.7     |

significantly declined in importance by a third from PRE (mean=3.92,  $SD=0.887$ ) to 6 MP (mean=3.49,  $SD=0.886$ ,  $U=6602$ ,  $p=0.000$ ). Observing large numbers of dolphins was also not an important factor to participants when deciding to participate in a dolphin-swim tour, with the level of importance decreasing significantly by a half from PRE (mean=3.45,  $SD=1.054$ ) to 6 MP (mean=3.00,  $SD=0.863$ ,  $U=6735$ ,  $p=0.000$ ).

### 3.3. Visitor biocentric attitudes and values towards dolphins and their environments

The modified NEP scale (Table 4) includes declarations about conservation, and is modelled to reveal negative and positive values amongst participants regarding conservation of the marine environment, assisting with marine conservation programs, conservation of dolphins and marine wildlife. Results revealed that participant's biocentric values concerning marine conservation were positive and relatively high, and that this increased significantly over time from PRE (mean=4.59,  $SD=0.631$ ) to POST (mean=4.66,  $SD=0.609$ ,  $U=315470$ ,  $p=0.008$ ), and from POST to 6 MP (mean=4.54,  $SD=0.707$ ,  $U=147789$ ,  $p=0.005$ ).

Participants NEP values were neutral regarding their intent to become more involved in marine conservation issues; make donations to environmental organisations; join wildlife/dolphin preservation organisations; donate time assisting with wildlife conservation; remove litter that could harm wildlife; decrease their personal water pollution levels; assist in protection of dolphins where possible and tell others about the need to conserve our oceans (Table 5). However, respondents were most likely to engage in minimal effort/low commitment conservation activities (e.g., pick up rubbish (mean=77.4%) or tell others about the need to care for our oceans (mean=65.6%)) than activities that require ongoing commitment and monetary donations (e.g., join a wildlife or dolphin preservation organisation (mean=16.5%)). Participants biocentric intent to be involved in conservation activities increased significantly over time from PRE (mean=3.11,  $SD=1.275$ ) to POST (mean=3.33,  $SD=1.275$ ,  $U=1101277$ ,  $p=0.000$ ), and from PRE to 6 MP (mean=3.26,  $SD=1.204$ ,  $U=543733$ ,  $p=0.011$ ).

### 3.4. Visitor motivation to adopt pro-active conservation initiatives

The majority of PRE participants had never participated in conservation activities (59.7%). After the dolphin-swim tour, participants levels of conservation activity increased by 9.7%, with half of participants now involved in conservation activities (Table 6). Level of responses for "I do not ever intend in participating in conservation activities" PRE was 7.0% but declined to 1.4% of participants 6 MP (Table 6). After the dolphin-swim tour, the number of participants who have never participated in conservation activities declined by 8.3% from 32.5% (PRE) to 24.2% (6 MP).

### 3.5. Visitor's knowledge and interest in dolphins

Visitors perceived their knowledge levels about dolphins had increased POST. The majority of PRE respondents had a perceived

**Table 4**

Mean NEP values for biocentric values—marine conservation.

| Biocentric values—marine conservation |      |
|---------------------------------------|------|
| PRE                                   | 4.60 |
| POST                                  | 4.66 |
| 6 MP                                  | 4.55 |

**Table 5**

Mean NEP values for biocentric values—intention.

|      | Overall biocentric values—intention | Minimal effort | Time and money output |
|------|-------------------------------------|----------------|-----------------------|
| PRE  | 3.11                                | 3.66           | 2.56                  |
| POST | 3.34                                | 3.89           | 2.79                  |
| 6 MP | 3.26                                | 3.83           | 2.68                  |

slight level of knowledge about dolphins (48.2%,  $n=91$ ) and this shifted to a perceived moderate level of knowledge POST (59.3%,  $n=115$ ) and 6 MP (68.4%,  $n=65$ ).

Results reveal that the time participants are most interested in topics about dolphins is post dolphin-swim (Table 7), with interest levels increasing for all factors from PRE responses, and declining for all 6 MP responses for majority of topics. The most popular learning category POST was dolphin's intelligence and strange characteristics (79.7%). Participant's level of interest increased significantly from PRE to POST for topics regarding: daily activities of dolphins; details about individual dolphins; breeding and rearing of young dolphins; dolphin distribution and population numbers; dolphins diet; dolphin conservation; and dolphin strandings and rescues (Table 7). Across the three sampling periods (PRE, POST and 6 MP), conservation topics held the highest levels of interest to customers and humanisation and indigenous topics held the lowest level of interest (Table 7). As seen in Table 7, there was no significant difference in participant's interest levels from PRE to 6 MP.

The majority of respondents indicated that harming dolphins should be punishable as an offence and believed that it is not ok to feed dolphins (Table 8). Temporally, participants were in highest agreement with statements that were conservation based, and patrons conservation levels regarding the importance of protecting dolphins increased significantly across time from PRE to 6 MP (Table 8), indicating that participants have high biocentric values. Participants environmental ownership (i.e., that their daily actions could affect dolphins and the marine environment) increased significantly across time from PRE to POST (Table 8).

### 3.6. Visitor satisfaction with dolphin-swim tour

Participants were highly satisfied with how close they got to dolphins, the dolphin swim rules they had to follow, the sea conditions and interest of information given (Table 9). Participants



**Table 6**  
Participant's current state of conservation activity.

|  | PRE (%) | PRE (n) | 6 MP (%) | 6 MP (n) |
|--|---------|---------|----------|----------|
| I am already involved in conservation activities   | 40.3    | 52      | 50.0     | 36       |
| I will get involved in conservation activities   | 3.9     | 5       | 2.7      | 2        |
| I have been thinking about participating in conservation activities for less than six months | 14.7    | 19      | 4.2      | 3        |
| I have been thinking about participating in conservation activities for more than six months | 34.1    | 44      | 41.7     | 30       |
| I do not ever intend in participating in conservation activities                             | 7.0     | 9       | 1.4      | 1        |

**Table 7**  
Participants level of interest (very-highly interested) for topics about dolphins (PRE, POST and 6 MP tour).

|   | Category     | PRE (%) | PRE–POST | POST (%) | POST–6 MP | 6 MP (%) | PRE–6 MP |
|---|--------------|---------|----------|----------|-----------|----------|----------|
| Daily activities of dolphins                      | General      | 48.4    | ↑*       | 63.1     | ↓*        | 52.1     | ↑        |
| Details about individual dolphins                 | General      | 50.0    | ↑*       | 59.9     | ↓         | 52.2     | 0        |
| Dolphins intelligence and strange characteristics | General      | 73.1    | ↑        | 79.7     | ↓         | 71.3     | 0        |
| Breeding/rearing of young dolphins                | General      | 50.0    | ↑*       | 63.1     | ↓         | 56.4     | ↑        |
| Dolphin distribution and populations numbers      | General      | 46.7    | ↑*       | 66.3     | ↓         | 57.5     | ↑        |
| Dolphins diet                                     | General      | 36.6    | ↑*       | 50.3     | ↓         | 47.8     | ↑        |
| Dolphin social habits                             | General      | 66.7    | ↑        | 74.9     | 0         | 73.4     | ↑        |
| Dolphins relationships with other species         | General      | 66.1    | ↑        | 74.3     | ↓         | 70.2     | ↑        |
| Dolphins importance in the ecosystem              | General      | 62.3    | ↑        | 74.8     | ↓         | 65.9     | ↑        |
| Marine environment conservation                   | Conservation | 63.5    | ↑        | 70.6     | 0         | 71.3     | ↑        |
| Dolphin conservation                              | Conservation | 62.9    | ↑*       | 74.4     | ↓         | 69.1     | ↑        |
| Dolphin stranding's and rescues                   | Conservation | 49.5    | ↑*       | 62.6     | ↓         | 58.5     | ↑        |
| Dolphin features that are similar to humans       | Humanisation | 52.7    | ↑        | 65.2     | ↓         | 50.0     | 0        |
| Dolphins interactions with aboriginals            | Indigenous   | 39.3    | ↑        | 47.5     | ↓         | 43.6     | ↑        |

\* Statistically significantly different at  $p < 0.05$ .

**Table 8**  
Participants biocentric values (or levels of knowledge) (agree–strongly agree) regarding dolphins (PRE, POST and 6 MP tour).

|   | Category               | PRE (%) | PRE–POST | POST (%) | POST–6 MP | 6 MP (%) | PRE–6 MP |
|---|------------------------|---------|----------|----------|-----------|----------|----------|
| It's ok to keep dolphins in captivity                           | Utilisation for people | 14.5    | ↓*       | 13.0     | 0         | 11.7     | ↓        |
| It's ok to feed dolphins  | Utilisation            | 19.3    | ↓*       | 9.2      | 0         | 9.5      | ↓*       |
| It's ok to swim with dolphins                                   | Utilisation            | 76.4    | ↑        | 79.5     | 0         | 79.8     | ↑        |
| Dolphins are an important resource to Australia                 | Utilisation            | 83.9    | ↑        | 89.7     | 0         | 89.4     | ↑        |
| Dolphins are more special than other wild animals               | Humanisation           | 18.3    | 0        | 18.4     | ↑         | 22.3     | ↑        |
| Dolphins have feelings  | Humanisation           | 84.9    | ↑        | 89.7     | 0         | 90.4     | ↑        |
| Dolphins have thoughts  | Humanisation           | 85.4    | ↑        | 87.6     | ↑         | 92.6     | ↑        |
| Dolphins are intelligent  | Humanisation           | 97.9    | 0        | 97.3     | 0         | 98.9     | 0        |
| Harming dolphins should be punishable as an offence             | Protection             | 89.3    | 0        | 88.7     | ↑         | 92.5     | ↑        |
| My daily actions affect dolphins                                | Ownership              | 45.7    | ↑        | 51.9     | ↑         | 64.9     | ↑*       |
| My daily actions affect the marine environment                  | Ownership              | 67.6    | ↓        | 65.4     | ↑*        | 73.4     | ↑*       |
| Dolphins are affected by events that occur in land environments | Conservation           | 91.4    | ↑        | 94.6     | 0         | 95.8     | ↑        |
| It's important to protect dolphins                              | Conservation           | 95.2    | ↑*       | 97.8     | 0         | 96.8     | 0        |
| It's important to protect the marine environment                | Conservation           | 96.7    | ↑        | 99.5     | 0         | 99.0     | ↑        |

\* Statistically significantly different at  $p < 0.05$ .

were not satisfied with information on how to help conserve dolphins and their environment, or the amount of time they swam with dolphins (Table 9).

### 3.7. Compliance

During period 1, there were 104 surveys conducted on-board tour vessels, resulting in 59 independent dolphin sightings. Mean tour duration was 3 h and 17 min ( $SE=4.413$ ). During period 2, 178 surveys were conducted, resulting in 104 dolphin sightings. Mean tour duration was 3 h and 22 min ( $SE=1.612$ ). Sighting success rate was 58.0% and 46.6%, respectively, for periods 1 and 2. During period 1, the total time dolphins were within 300 m of tour vessels was 25 h and 38 min (mean=22 min 8 s) compared to 46 h and 6 min (mean=26 min 35 s) for period 2. Of the 8 conditions assessed across 1998–2013, tour operators demonstrated satisfactory compliance to only 2 of the conditions (number of swimmers and education, Fig. 2).

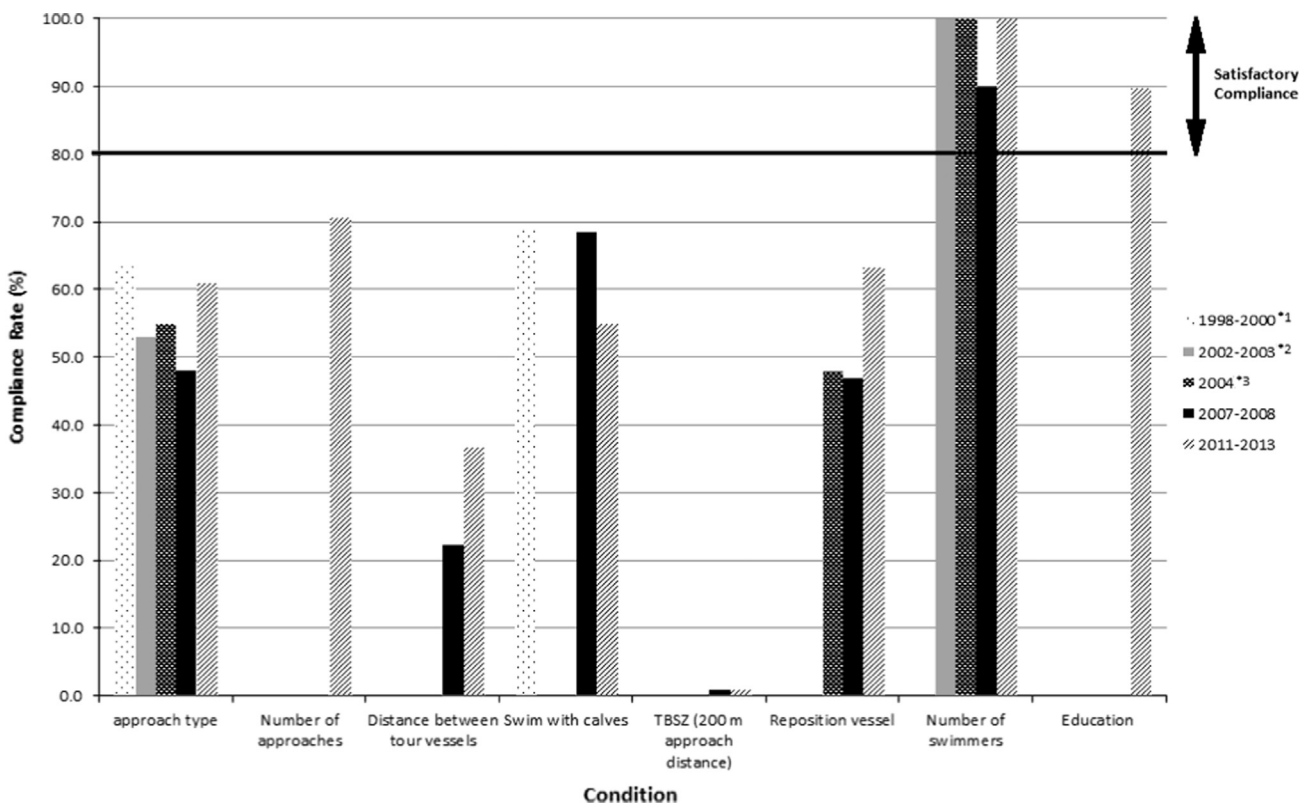
## 4. Discussion

### 4.1. General discussion

A non-compliant dolphin-swim industry that does not satisfy the tourist expectation, could negatively deteriorate the experience, impact future sustainability and decrease future business potential. In PPB, the top three motivators to participate in a dolphin-swim tour for tourists were observing dolphins in their natural environment, opportunity to see dolphins and knowledgeable staff. Observing large numbers of dolphins and getting close to dolphins ranked the lowest motivator for participants to commit to a dolphin-swim tour. Furthermore, participants continued to assign decreasing value to these two factors across time, indicating that they are not important features in a tour from the perception of the participants. Indeed, across time, the majority of participants were highly satisfied with the proximity of the tour vessel to dolphins during the tour, reinforcing the fact that geographical proximity of dolphins to tourists is not important

**Table 9**  
Participants level of satisfaction (very-highly satisfied) with various aspects of their dolphin-swim (POST and 6 MP tour).

|  | Category          | POST | POST-6 MP | 6 MP |
|--|-------------------|------|-----------|------|
| Number of dolphins I saw                                 | Dolphin           | 66.5 | ↓         | 63.1 |
| How close I could get to dolphins                        | Dolphin           | 63.8 | 0         | 63.1 |
| Health of dolphins                                       | Dolphin           | 73.8 | ↑         | 76.9 |
| Natural behaviour of dolphins                            | Dolphin           | 72.3 | ↓         | 70.5 |
| Amount of time I spent watching dolphins                 | Dolphin-time      | 57.6 | 0         | 58.9 |
| Amount of time I swam with dolphins                      | Dolphin-time      | 44.0 | ↓         | 40.0 |
| How closely you observed the dolphins                    | Dolphin-proximity | 63.3 | 0         | 64.2 |
| Amount of watercraft in area                             | Experience        | 63.9 | ↓         | 61.0 |
| Number of people in the water                            | Experience        | 71.2 | ↓         | 66.4 |
| Space available on boat for visitors                     | Experience        | 76.9 | ↑         | 81.1 |
| Sea conditions during tour                               | Experience        | 82.2 | ↑         | 85.3 |
| Dolphin-swim rules I had to follow                       | Rules             | 80.6 | ↑         | 83.2 |
| Interest of information given                            | Knowledge         | 80.1 | ↑         | 85.2 |
| Information on how to help conserve dolphins             | Knowledge         | 46.6 | ↑         | 60.0 |
| Information on how to help conserve dolphins environment | Knowledge         | 46.6 | ↑         | 61.0 |
| Overall satisfaction                                     | General           | 83.8 | 0         | 83.1 |



**Fig. 2.** Compliance rates to conditions stipulated in the Wildlife (Marine Mammal) Regulations for dolphin-swims in Port Phillip Bay Victoria, across 436 surveys, 1998–2013. \*1 [27] \*2 [28] \*3 C.S. personal observations.

for participant’s satisfaction, and that non-compliance by tour operators to this condition is not constructive for business.

Development of simpler regulations and stricter conditions did not motivate tour operations to improve compliance. However, participants were satisfied with the dolphin-swim rules they had to follow. Previous research indicates that participants want guidance and are likely to comply with rules and regulations once explained, because tourists do not want their actions to impose disturbance on targeted wildlife [41,42]. For example, Ballantyne et al. [17] found that when whale watching participants were aware that they had to abide by regulations in order to minimise impacts on the whales, the experience was made even more special for tourists. The Wildlife (Marine Mammal) Regulations [38] restricts approach type, the number of swims a tour operator can attempt per trip, and does not permit tourists to swim with calves. However,

tour operators fail to comply with these conditions and consequently, from 1998 to 2013 there has been an increase in dolphin’s avoidance to tour vessels [43]. This potentially could result in a decrease in the amount of time tourists observe dolphins under the water, ensuing in decreased customer satisfaction. Presently, less than 50% of participants were satisfied with the amount of time they swam with dolphins, however, customers indicated that they were happy to follow dolphin-swim rules. Thus, it is recommended that tour guides explain why regulations are in place in order to increase customer satisfaction and encourage business growth. To facilitate compliance (e.g., do not swim with a calf; only 5 approaches per dolphin group per tour) tourists should be advised that the intent of the regulations is to reduce disturbance to the dolphins. By explaining regulations to customers prior to the dolphin-swim, participant’s expectations will be managed, reducing

disappointment and increasing customer satisfaction. Furthermore, this will remove pressure from tour operators to breach regulations.

The small population size of the dolphins in PPB, increased number of tourists in the peak summer season, co-operative sighting strategies amongst tour operators, tour vessels alternating swimmers to interact with a single dolphin group and the lack of enforcement in southern PPB, has meant that frequently there are high concentrations (up to 10 vessels per group of dolphins) of traffic (tour and recreational vessels) around dolphin groups. This crowding creates a competitive scenario amongst tour operators for access to dolphins, triggering non-compliance to the prescribed minimum distances between tour vessels. The results presented indicate low customer satisfaction to number of boats around dolphins and implied participants experienced perceived crowding. Bell [44] reported that number of boats had a significant impact on the quality of visitor experience for visitors to Molokini Shoal Marine Life Conservation District, Hawaii, with two-thirds of respondents feeling crowded and 80% supporting management interventions that would limit the number of boats in the area. Therefore, satisfactory compliance is not only important to mitigate the effects of tourism on the targeted species but can also improve customer satisfaction that in turn, could provide economic growth *via* repeat business, word of mouth recommendations, and positive reviews through marketing websites (e.g., trip advisor).

Across time, participants valued knowledgeable staff and this remained a consistently important feature to patrons when deciding on participating in a tour. These results reinforce that education is wanted by participants, that they expect interpretation as part of their tour, and indicates that tour leaders are central to the tourist experience. However, tourists were only moderately satisfied with information they received on conserving dolphins and their environment. Importantly, for management, what tourists want (education) is not going to be an expensive outlay for tour operators and could be used as a vehicle to trigger positive action by tourists (e.g., join a dolphin/conservation group, or a dolphin stranding/rescue group) post dolphin-swim trip to encourage pro-conservative behaviours. This study also identified that the optimal time to conduct educational activities is after the dolphin-swim, as participants are most interested in different topics about dolphins and their environment at this time. These results concur with Ballantyne et al. [17], Hrycik and Forestell [22], and Lück [15] who found that during the “post-contact” phrase, whale-watching participants were most receptive to information on biology and conservation of cetaceans, were more likely seek further information and reconsider global environmental threats.

The lack of information provided to dolphin-swim participants affects the conservation potential of this industry [6]. The majority of PRE respondents had a slight perceived level of knowledge about dolphins and this increased to a moderate level for the majority of POST and 6 MP participants, indicating that participants perceived increase in knowledge levels lasts across time and is not superficial. Participants felt that they gained knowledge on-board the dolphin-swim tours, indicating that tours can be an effective way to educate people and raise their biocentric levels; although there is the potential for further increase here. Dolphin-swim tours can be a good vehicle for education, as demonstrated by the significant decrease across time in participant's level of agreement to the statement ‘it is OK to feed dolphins’. However, despite being ranked (PRE) as the second (knowledgeable staff) and fourth (interesting information), most important aspects of the tour service, a number of POST participants were dissatisfied with information provided on dolphin-swim tours in PPB. Although participants in this study were educated (over 60% tertiary qualified), their initial level of knowledge about dolphins was low (50%=none or slight), indicating that in order for

interpretation to be successful in promoting marine conservation ideals, tour operators in PPB need to provide basic information on the fundamentals of dolphin ecology and their marine habitat issues.

There was a 20% increase in the number of participants from PRE to POST and 6 MP who realised that their daily activities can affect dolphins, indicating that tour participation has made them more aware of the consequences of their actions. Furthermore, participant's biocentric values concerning marine conservation are positive and increase significantly across time. Therefore, it can be surmised that tours can be a vector for promoting pro-environmental beliefs. However, although the majority of participants had biocentric values, they were not members of environmental organisations and failed to demonstrate pro-conservative actions, revealing that positive biocentric values do not necessarily transcend to actions. Dolphin-swim participants were unwilling to outlay time, high levels of effort or finances to help conserve dolphins and their environment. However, participants were more likely to take conservation actions that require minimal amounts of time or effort (i.e., remove litter that could harm wildlife). When participants perceive that their actions could have a direct impact on the environment, they have a higher intent to take action to help. Participant's commitment to biocentric action is dependent on the level of investment required, with minimal effort activities (e.g., communicate to others about the need to conserve the marine environment) being the most likely actions to occur.

A limitation of this study was that less than 1% of participants completed all three questionnaires. Furthermore, the response rate was exceptionally low (< 6%), indicating a positively biased data set, as people who are already biocentric are more likely to participate. Previous research examining the human dimensions of marine wildlife tourism *via* questionnaires received response rates in the range of 54–76% [11,15,18,35,45]. The aforementioned studies all distributed their questionnaires in person, and therefore the lower response rate received herein is likely due to the fact questionnaires were distributed online, whereby participants have no personal contact with the researcher and therefore, may feel less obliged to participate. Thus, it is recommended that future social science research, that collects data *via* questionnaires, be distributed in person to achieve a higher response rate and less biased sample. Alternatively, to increase participation rates, incentives such as price reductions on tour bookings, partial refunds or discounts on future tours could be offered.

Other recommendations that the authors suggest be implemented to increase participant's biocentric and satisfaction levels, improve the sustainability of the dolphin-swim industry in PPB and increase economic growth include: (1) tour operators incorporate topics of interest to participants (as detailed in results, Section 3.5) into the on-board interpretation; (2) tour operators target activities in their interpretation that participants have shown interest and intent in doing (detailed in results, Section 3.3); (3) interpretative material to be scheduled at specific times of the tour, (e.g., explain regulations prior to the dolphin-swim and deliver conservation information after dolphin encounters); and (4) initiate compulsory annual training programs, that are delivered by the managing body to staff of tour companies. Training should aim to raise staff's awareness of all regulations and what interpretation needs to be provided on the tour. Training should incorporate information on the biology and conservation of the targeted species, and actions that participants can take to become involved in conservation activities (e.g., brochures and websites participants could visit). By developing a structured, comprehensive interpretation program, with input from researchers, stakeholders, and the governing body for the industry, tour operators have the opportunity to increase customer satisfaction levels by meeting their need and expectation for knowledge during

dolphin-swim tours. Results presented herein suggest that the opportunity to learn about conservation is likely to enhance, rather than detract from the experience. Economically, this will benefit the industry as satisfied customers are more likely to bring repeat business to the industry. However, on-going monitoring is vital to determine if training programs are effective over time and to determine if there is an increase in tour operator's compliance corresponding with an increase in tourists increased knowledge.

#### 4.2. Conclusions

With a history of non-compliance, and a lack of government enforcement, there needs to be a shift from ownership falling solely on tour operators to ownership being shared between tour operators and patrons. It appears as though tourists, if properly educated, can be used as a means to increase tour operator compliance, as tourists are happy to comply with regulations and they do not want to have a negative impact of the targeted species. This paper demonstrates how human dimensions of dolphin tourism are important for the successful management of the industry. By giving tourists what they actually want, commercial operators are empowered to conserve the sustainability of the industry while potentially increasing profit margins.

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