Research in Progress: Does Environmental Interpretation Influence Behaviour through Knowledge or Affect?

Stories from Practice

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Introduction

Interpretation is frequently seen as effective in managing tourist-wildlife interactions because it increases awareness about a species and encourages a conservation ethic (Beckmann 1991, Moscardo 1998). Interpretation has been advocated as the most effective management strategy for wildlife encounters (Orams 1996). Implicit in this belief is that by changing people's attitude, interpretation will change their behaviour (Roggenbuck 1992).

Petty *et al.* (1997) define an attitude as an evaluation of an object (eg. people, animal, etc.) that exists along a dimension ranging from positive to negative. In reflecting on attitude change it helps to conceptualise an attitude as comprised of three main components: affect, cognition, and behaviour. The affective component consists of a person's feeling towards an object, the cognitive component consists of a person's knowledge and understanding of an object and the behavioural component involves a person's actual behaviour towards the object (Knudson *et al.* 1999).

Although attitude is conceptualised as having three main components, most past research on interpretation has focused on changes in cognition (Beckmann 1991). Howard (1998) suggested that as people attend interpretive programs at leisure affective realms are important, and as such, mood theory might improve our understanding of: the intrinsically rewarding feelings that characterise this type of leisure experience; and how interpretation may influence people's behaviour. The influence of affective realms on interpretive programs is poorly understood and not well researched (Howard 1998). This paper contributes to our understanding of cognition and affect in interpretive setting by providing the results of a preliminary study conducted at Mon Repos Conservation Park.

Background to the Site

Mon Repos Conservation Park, about 14km east of Bundaberg is the most important nesting site for sea turtles on the mainland of Australia (Kay 1995). It is also one of the two largest loggerhead (*Caretta caretta*) rookeries in the South Pacific Region (Office of National Tourism [ONT] 1996). On most nights from mid-November to early February sea turtles lay their eggs on the sand. About 7-9 weeks later the eggs hatch and hundreds of turtle hatchlings scamper down the beach to the sea. Loggerheads are the most common turtle with flatback turtles and green turtles also nest in the area.

In response to increasing crowds of people, the Queensland National Parks and Wildlife Service initiated a turtle watching program in 1985 in conjunction with the turtle research already taking place on the beach (ONT 1996). The interpretive program aims to stimulate thinking about conservation issues and introduce basic turtle biology. The program caters for over 25000 visitors a year (ONT 1996).

A visitor centre, amphitheatre and turtle-watching program are in place, and staffed by a team of experienced full-time professionals and volunteers (Kay 1995). During the turtle season, night access to the rookery is through the information centre. While waiting to go out onto the beach, visitors may browse through the information centre, watch the slide shows, and listen to an impromptu talk or see videos in the outdoor amphitheatre. When a turtle is located, visitors, under the guidance of trained staff, are escorted onto the beach in groups of up to seventy people.

Methodology

As part of a larger study, fifty visitors to Mon Repos were surveyed twice: once immediately before a visit and then six months after a visit. The study was conducted in summer 1997-98 nesting season.

To assess knowledge, both the before and after survey contained fifteen true/false questions divided into five areas: turtle biology, turtle reproduction, turtle conservation, Mon Repos Conservation Park, and the management authority. The survey also asked people to name three species of turtle.

Affective realms were surveyed six months after the visit by postal questionnaire using the Total Design method (Dillman 1978). Mehrabian and Russell (1974) contend that human

responses to environments can be explained in terms of three bi-polar dimensions: pleasure-unpleasant, arousal-unaroused, dominant and submissive (P-A-D). Pleasure describes feeling of happiness and enjoyment. Arousal describes feelings of excitement and surprise while dominance describes feelings of mastery and skill. The respondents were asked to rate the visit on nine 7-point semantic scale items six months after the visit. The pleasure dimension was measured by three items: pleasant-unpleasant, enjoyable-unenjoyable and fulfilling-disappointing. The three items used to measure arousal were: stimulating-boring, exciting-dull, inspiring-uninspiring. Dominance was measured by three items: successful-unsuccessful, lucky-unlucky, controlled-uncontrolled. The codes assigned for responses to these items ranged from +3 to -3.

To measure behaviour, the same postal questionnaire was used. The mail survey asked people about their intention and actions to conserve turtles. Intention was measured by asking whether a visitor thought they would now do more to conserve turtles following the visit using a yes or no response. Action was assessed by asking respondents to name something specifically they had done since their visit.

Quantitative results were analysed using the Statistical Package for Social Sciences (SPSS). Chi-squared tests were used to determine significance for people reporting changes in behaviour with knowledge and affective scores. A subsequent logistic step-wise regression was used to determine the relationship between those significant realms found in the chi-square and those of reported behaviour.

Results

In terms of cognition, a comparison of visitor knowledge before and after the visit shows that knowledge generally increased 6 months after a visit to Mon Repos (Table 1).

Table 1: Changes in knowledge of visitors before and after a visit to Mon Repos Turtle Rookery

Question	% Correct before visit	% Correct 6 month after visit	% Did not know before	% Did not know after
Biology - Are amphibians	56	28	16	4
Biology- Breathe underwater	80	82	2	2
Biology- Live for over fifty years	96	100	2	-
Park – The only one in Australia	80	84	12	8
Park – Declared to protect the rookery	82	90	14	10
Park- One species of turtle nest	78	94	16	2
Reproduction – Certain times of the year	96	100	2	-
Reproduction – Temperature affects	74	84	20	6
Reproduction - Mother helps hatchlings	92	100	4	-
Conservation - People eat them	92	96	4	4
Conservation - Plastic bags	88	100	10	-
Conservation - Feral animals	65	78	24	14
Mgt - Rangers are from Bundaberg Council	24	30	44	48
Mgt – QNPWS sole authority for turtles	12	10	38	28
Mgt- QNPWS doing research at park	80	81	16	14

People had the greatest increase in knowledge in the areas of turtle reproduction and conservation. These areas are the main educational component of the interpretive program at Mon Repos. There was also an increase in the number of people who could name three species of turtle (Table 2). Decreases in knowledge occurred for some questions about turtle biology and the management authority.

Table 2: Percentage of visitors correctly naming three species of turtle before and after the visit

Responses	% Before	%After
Visitors listing species in order of frequency that occur at Mon Repos	24	28
Visitors listing species that occur at Mon Repos	53	58
Visitors listing any three species of turtle	56	64

In terms of affective realms, the results showed that most visitors found the experience enjoyable, with scores of enjoyment and pleasure the highest (Table 3). Lowest scores were for control and luck. The results also obtained significant Cronbach Alphas for each of the three questions of pleasure (Cronbach Alpha =0.69), arousal (Cronbach Alpha =0.77), and dominance (Cronbach Alpha 0.75) and thus each of these three scores were pooled. Using the pooled scores the highest result was for the affective realm of pleasure and lowest for the affective realm of dominance.

Table 3: Scores of Affect with visitors

Paired statement	Mean	S.D.
Enjoyable-unenjoyable	1.56	1.32
Pleasant- unpleasant	1.77	2.89
Inspiring-uninspiring	1.81	1.12
Stimulating-boring	1.90	1.10
Exciting-dull	1.94	1.16
Successful-unsuccessful	1.98	1.45
Fulfilling-disappointing	2.13	1.55
Controlled-uncontrolled	2.17	1.52
Luck-unlucky	2.54	2.08

When asked about behaviour after the visit, thirty-seven visitors (74%) said they would do more now that they had visited Mon Repos and 50% stated they had done something specifically in the last 6 months. The most common behaviour reported was 'spreading the word amongst friends and family' (9 visitors), however 'teaching people' (4 people), and 'removing litter from beaches' (5 visitors) were also common responses. Other responses included 'becoming a volunteer at Mon Repos', 'releasing turtles in nets', and 'report sightings of turtles'.

Positive reports for any of the affective realms of pleasure, arousal or dominance could not be correlated to higher scores of knowledge. However, chi-squared found positive experiences only in affective realm of arousal were significantly higher in

those people stating an both an intention to conserve turtles 6 months after the visit ($c^2 = 11.816$, p = 0.003) as well as those people reporting doing an action to conserve turtles in the last 6 months ($c^2 = 6.18$, p= 0.019). Higher levels of knowledge were not significantly higher for those people reporting an intention to act, but they were significantly higher for those people reporting an action to conserve turtles in the last 6 months ($c^2 = 5.327$, p= 0.03). A subsequent step-wise regression using knowledge and the affective realm of arousal found that those people who stated they intended taking action to conserve turtles 6 months after the visit was correlated to the state of arousal reported. By contrast, those people who reported they actually taken action to conserve turtles in the last six months was correlated by both arousal and knowledge realms (Table 4).

Table 4: Regression co-efficients for knowledge and affecting realms found by visitors

Type of behaviour	Model	Unstandardised coefficients		Standardised coefficients	t	Significance
		B	Std Error	Beta		
Intention	(constant)	1.207	0.119		10.144	0.00
	Arousal	-0.07353	0.019	-.496	-3.879	0.00
Reported	(constant)	0.156	0.324		0.482	0.632
	Arousal	-0.06506	0.024	-0.357	-2.735	.009
	Knowledge	0.07335	0.029	0.330	2.530	0.015

Discussion

Much of the philosophy of interpretation is based on creating deeply affective experiences (see Beck & Cable 1998). Ballantyne and Uzzell (1993) urged interpreters to provide such 'hot' interpretation to stimulate visitor reactions and outlined some case studies where this has occurred. This is the first study in Australia to distinguish between the 'cold' cognitive processes (ie. recalling the name of a turtle) and the 'hot' processes (ie. the surprise of hatching emerging on the sand). It shows that interpretive experiences can be similar to recreational experiences in that they are viewed as being pleasurable and arousing (Russell 1980, Floyd 1997). It is part of a growing body of research into interpretation that shows feelings of surprise, interest, involvement, control and novelty increase mindfulness and learning (Moscardo 1996).

The affective realm is important in human responses to environmental settings and as a guide to behaviour (Holbrook 1986, Hull & Harvey 1989). Using the P-A-D model of affect, those visitors who reported behaviour change, and an intention to change behaviour, tended to report the experience at Mon Repos as arousing. Interpreters have implicitly recognised the importance of such moods. For example the personal accounts of environmental interpreters, such as Henry Thoreau and Freeman Tilden, are deeply inspirational in their feelings towards the American wilderness (Beckmann 1991).

On the whole, knowledge increased after the visit, particularly in the areas of conservation and turtle ecology. The limited data in this study therefore suggest interpretation at Mon Repos is achieving its objectives as it stimulates thinking about conservation issues and introducing basic turtle biology. This finding is similar to Orams (1997) survey of people 2-3 months after a visit to Tangalooma Dolphin resort which found knowledge about dolphins increased after an interpretive program.

The study by Orams (1997) also assessed whether people changed their behaviour after a visit to Tangalooma. He found that a high percentage of visitors reported telling friends about dolphins and picking up litter from the beach. Although there can be no direct comparisons due to methodological differences, visitors at Mon Repos reported similar types of behaviour (ie. spreading the word and removing litter from beaches). However, this study has also detected some behaviours requiring a high level of commitment such as volunteering at Mon Repos, releasing turtles in nets, and reporting sightings of turtles to the park agency.

Although no link between knowledge and affect was found in this study, affective realms change behaviour in part through their impact on cognition (Hull 1991). Thus a question of whether cognitive or affective realms are important to behaviour is flawed. It is difficult to categorise some impacts of an interpretive program as either cognitive or behavioural. Mood states for example influence what is attended to in the environment and therefore can have a profound impact on cognition and behaviour (Hull 1991, Moscardo 1996). The question therefore should be modified to assessing the extent affective or cognitive realms influence behaviour. This study found that the affective realm of arousal was more important than knowledge in reporting behaviour change. By having a control group, and determining behaviour prior to the visit, it will be possible to determine whether the interpretive program at Mon Repos did actually produce a change on people's behaviour. This is planned in the near future.

To conclude, interpretation at Mon Repos appears to be achieving its objectives because it stimulates thinking about conservation issues and introduce basic turtle biology. A high number of people reported conservation behaviour after the visit, which is similar to Orams (1997), however this study detected some behaviours requiring a relatively high level of commitment. While this study has a number of design flaws, the data indicates the affective component of interpretive programs is important in encouraging long-term conservation behaviour. Further study with a control group, and larger sample size is required. ☪

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