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Pete's story: interpreting the consequences of risk-taking behaviour

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Abstract

This paper documents the initial evaluation of a trial 'interpretive safety sign' at 'The Cougal's', a popular natural swimming area in Springbrook National Park, Gold Coast Hinterland, Queensland, Australia. The 'interpretive safety sign' details the consequences of risk-taking behaviour in and around the cascades and rock pools at 'The Cougal's' through the telling of a story of a person whose life had changed as a result of a swimming related accident.

The major objective of the study was to determine the effect the 'interpretive safety sign' was having on visitor awareness and risk-taking behaviour at 'The Cougal's'. A questionnaire was used to collect data from 169 respondents, 63 of whom specifically included a swim as part of their visit to 'The Cougal's'. Data interpretation suggests the sign is having a positive effect on visitor awareness about the dangers of diving or jumping into natural watercourses and on some swimmers' risk-taking behaviour. However, data interpretation also suggests that the use of signs to promote awareness and appropriate behaviour is still imperfect. While this finding may be more to do with the risk taking propensity of some visitors, the use of an 'interpretive safety sign' will assist visitors to make an informed decision of the consequences of misadventure.

Key words: warning signs; visitor safety; risk management, persuasive communication; interpretation

Introduction

The Cougal's Cascades is located at the end of the Currumbin Valley Road in the Gold Coast Hinterland in South East Queensland, Australia (Figure 1). It is part of Springbrook National Park (and part of the Central Eastern Rainforest Reserves World Heritage Area) and is a popular natural swimming destination for many locals and visitors; especially young adults aged 17 to 24 and 25 to 34, during the hotter months of the year. So far, two people have sustained paraplegia caused by swimming related accidents in this part of the national park in recent years. While no deaths have occurred,

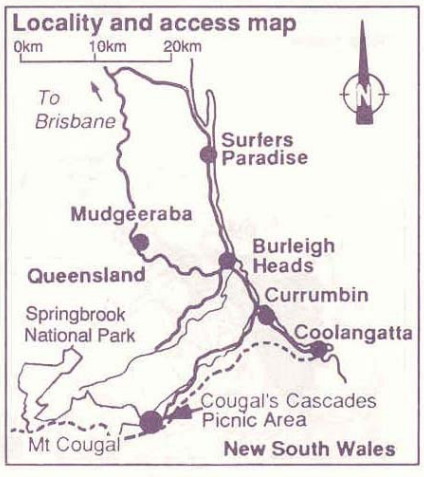

Figure 1: 'The Cougal's' locality and access map

the area presents a major visitor safety issue and on-site signs (refer Figures 2 and 3) and sporadic patrols by QPWS staff alert would-be swimmers to the inherent dangers of the area.

The issue

Visitor safety at 'The Cougal's' is a management priority for QPWS staff in this region (QPWS, 2002). However, existing safety signage is having minimal effect on people who visit 'The Cougal's' to swim in the cascades and/or rock pools at this location (Figures 2 and 3). This is because most people swim at 'The Cougal's' to cool down or because the amenity of the location (e.g. nice place, good scenery, great jumps) appeals to them (Parkin, 2003).

Figure 2: Warning sign located at the start of 'The Cougal's' walking track

Figure 3: Warning sign located at entry to each viewing platform

The closure of public access to the cascades and rock pools is an option due to their potentially hazardous features, but the long history of recreational use and popularity of 'The Cougal's' as a swimming destination means the exclusion of the public is unlikely to succeed given available management resources. Consequently, a management decision to positively and proactively address the situation through the trialing of a sign that provides a first-hand account of a swimming related accident was deemed more appropriate than attempts to restrict access or close the site with the potential for negative public perceptions and difficulties in managing non-compliant activity.

Past experience and lessons learnt

Interpretive safety signs

The use of on-site signage to warn visitors of the risks present and the preventative measures that can be taken to mitigate the consequences of those risks is a common approach taken by many protected area agencies and is in preference to other forms of control, such as restricted access and/or enforcement (McCool & Braithwaite, 1992). However, the use of a sign to provide a first-hand experience of an accident has not been recorded in the literature previously. The idea of presenting and portraying a person whom suffered from paraplegia was the key to having the 'interpretive safety sign' *talk* to its audience.

A wide web search located only one site that was written by a person (based in Holland) whom suffered from spinal cord injury sustained from a water-based activity. Contact with Dr Sam Ham (University of Idaho, USA), John Veverka (Heritage Interpretation, USA), Professor Jeff Wilks (University of Queensland, AUS), Terry Brown (Griffith University, AUS) and Austin Adams (University of New South Wales, AUS) all know locally and internationally for their work in the fields of interpretation and risk management was also made for advice. The result was a broad bibliography on the effectiveness of signage and safety-based research along with recommendations to contact the USA Army Corps of Engineers (which manage numerous lakes and reservoirs in the USA), and the Quadriplegic and Paraplegic Association of Queensland as the proposed sign would be of interest to their members. These contacts added practical experience and anecdotal information to the literature collected.

Use and compliance with advisory and warning signs

In general, the use of advisory and warning signs by protected area agencies in Australia must comply with Australian Standards AS 2342-1992 (Development, Testing and Implementation of Information and Safety Symbols and Symbolic Signs) and if applicable, AS 2416-2002 (Design and Application of Water Safety Signs). In addition, Australian protected area agencies must also comply with their own signage standards where they exist (QPWS, 2001).

Research by Beckmann (1995) also added a valuable insight to our understanding of awareness and visitor behaviour around natural watercourses. Beckmann found that a swimming condition safety sign used at several sites along the Murrumbidgee River in the Australian Capital Territory (ACT) was proving to be an unsatisfactory communication medium. (The Murrumbidgee River Corridor is accessed by ACT residents to the level of about 1 million visitor-days per year). The signs used a moveable arrow to convey the site manager's view as to whether swimming conditions were 'Unsafe' (red) or to 'Take Care' (blue). In particular, her research found that:

a) people did read the sign and acknowledged its intent, but tended to make up their own mind based on 'are other people swimming?'; and

b) high-risk takers (i.e. young men) would generally read the sign on arriving at the site, acknowledge what it said, but would ignore both it and any dangerous conditions (e.g. flooding, fast currents) if they could have a good time by taking the risk (Beckmann, 1995; Beckmann, pers com., 7 Dec 2000).

Parkin (2003) also provided us with evidence that people were likely to ignore warning signs to go swimming if it was hot (i.e. because they want to cool down), the ambience of the setting appealed to them (i.e. nice place, peaceful location) or they saw other people swimming there (i.e. the presumption it was safe to swim there). This research also concluded that people who regularly swam at a particular location were unlikely to change their decision even if they knew that people had been seriously injured at that location in the past. This was because they believed a similar accident would not happen to them (Parkin, 2003:22).

The literature on safety education does however provide some direction for safety signage. Warnings must be clear; convey the appropriate response; be perceived as coming from a credible source; be reinforced socially and at the local level; use an appropriate medium to disseminate the warning; and have an appeal (tone) that is effective in changing behaviours (Sims & Baumann, 1983:178-180 and 185-186; see also McCool & Braithwaite, 1992:312-315). Persuasive communication that enhances the tone of the warning can also contribute to the effectiveness of a safety sign (McCool & Braithwaite, 1992; Lackey & Ham 2003). This is achieved by making the information contained on the sign directly relevant to the reader and the activity they are about to participate in by outlining the likely consequences of their risk-taking behaviour.

'Interpretive Safety Sign' intent and target audience

The 'interpretive safety sign' forms part of the interpretation of the site and aims to influence all visitors to the site about the dangers of swimming in a natural area. Its basic design, layout and format comply with QPWS policy and guidelines for interpretive signs (QPWS, 2001). The underlying interpretive theme for the site is:

> *The cascades are an attractive though dangerous natural force, which have witnessed and contributed great changes through time — they have shaped the landscape, created habitats, cooled engines in the timber sawmill and now provide a passive, recreational escape from the urban madness (QPWS, 2002:3).*

The 'interpretive safety sign' reinforces the sub-theme that visitors should ensure their own safety by acting responsibly and to adhere to safety directions while visiting 'The Cougal's'. It is located on the viewing platform that has witnessed previous accidents. It is titled "The power to change lives" and details *Pete's story* (Figure 4). The sign informs visitors that two people have sustained spinal cord injuries because they either jumped or dived into the creek. The sign also reinforces the message that death by drowning is the greatest threat to people who injure their spine through jumping or diving into water.

The illustration of 'Pete' and the accompanying text is designed to make the reader feel uncomfortable; uncomfortable enough that they are willing to question and possibly change their intended behaviour to ensure their own safety. Uzzell (1989) refers to this as 'hot' interpretation. The concept also reflects Tilden's (1977) fourth principle of interpretation; that a chief aim of interpretation is not instruction, but provocation. The aim is to engage the public's attention and challenge them to examine their attitudes and actions to bring about change in the way they relate to the environment, themselves and their personal safety. The use of persuasive communication is in keeping with contemporary psychological approaches to changing behaviour (Ajzen & Fishbein, 1980; Roggenbuck, 1992; McCool & Braithwaite, 1992).

While the sign aims to influence the risk-taking behaviour of all visitors who swim at 'The Cougal's', the prime target audience is young adult males as they are the most frequent visitors to swim at this

location (Parkin, 2003). They are also considered more likely to have an accident while swimming at this site than any other age group because of their risk-taking propensity, lack of judgement/maturity and/or susceptibility to peer pressure (Parkin, 2003:11-12). Hence, the graphic used to illustrate 'Pete' is designed to reflect this age group.

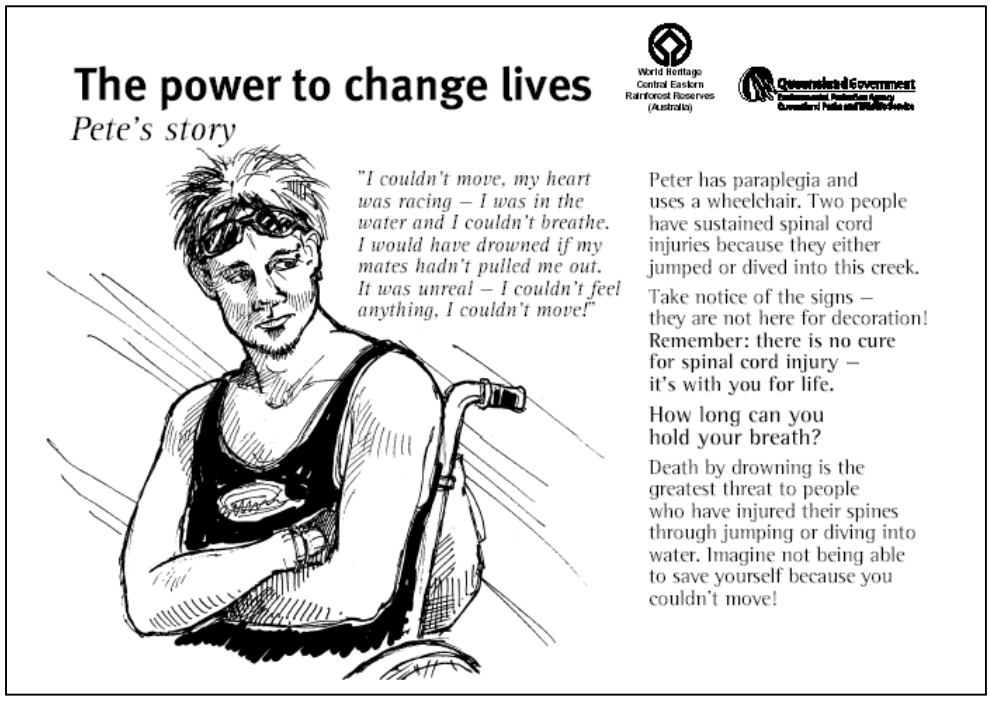

Figure 4: 'The Cougal's' interpretive safety sign

Methodology

Survey instrument

To test the initial effectiveness of the newly placed 'interpretive safety sign' (installed the week prior to the Easter 2003 holiday break), a questionnaire was administered onsite during the Easter 2003 (Saturday 19 April – Monday 21 April 2003) holiday break. Apart from gathering basic demographic information, the questionnaire asked visitors to identify the activity that best describes their visit, how they found out about 'The Cougal's' and whether they noticed any signs warning against diving into or swimming in the cascades and/or rock pools during their visit. It also asked visitors whether they specially saw the sign detailing '*Pete's story*', whom they thought (sex and age) it was directed towards and whether they felt the sign was sufficient to advise people about the dangers of swimming in a natural area. In addition, the questionnaire sought to determine why some people chose to swim at 'The Cougal's', the precautions they took while swimming and whether the sign detailing '*Pete's story*' had influenced their decision to swim there in any way.

Survey population

The survey population chosen to complete the questionnaire was based upon the selection of every third visitor about to end their visit to 'The Cougal's'. While large single sex groups were avoided, no gender and/or age group was specifically targeted. Approximately 185 visitors were approached during the survey period. However, about 10 percent of visitors asked to complete a questionnaire declined to do so with the result that 169 completed questionnaires were obtained. While most visitors chose to complete the questionnaire on their own, some respondents completed the questionnaire with assistance from survey administrators.

Data analysis and interpretation

For the purpose of the study, data analysis and interpretation were based on the following categories:

- swimmers and
- sightseers (Figure 5).

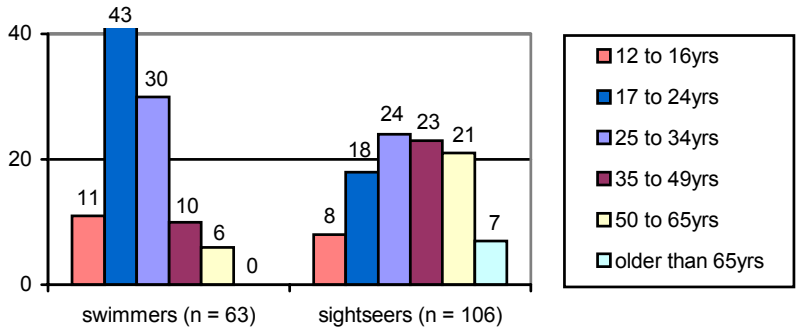

Figure 5: Respondent categories and age groups

In general, swimmers were respondents who had come to 'The Cougal's' for the sole purpose of swimming in the cascades and/or rock pools (49%) and respondents who included a short walk as part of their visit to swim in the cascades and/or rock pools (51%) (Figure 6). In contrast, sightseers were respondents who were on a day out sightseeing and visiting places of interest (39%), had come to 'The Cougal's' to view the cascades and/or the old sawmill (51%) or who included a picnic as part of their visit (10%) to 'The Cougal's'.

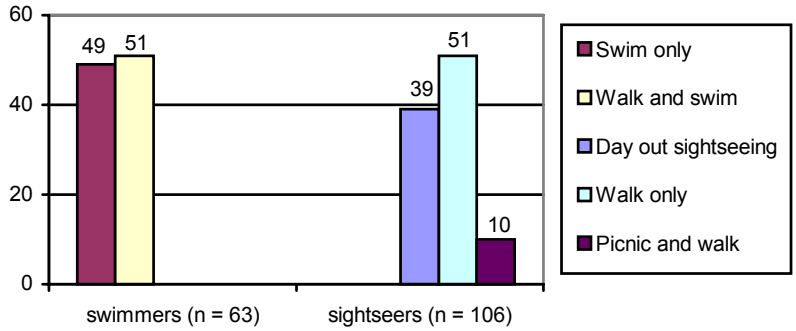

Figure 6: Respondent category and purpose of visit to 'The Cougal's'

The categorisation of data into two groups provides an analysis based upon the two main groups of visitors to 'The Cougal's'.

Findings and discussion

Respondent's observation of on-site warning and interpretive safety signs

Ninety-seven percent of respondents (n = 162) said they noticed a sign (or signs) warning against diving into or swimming in the cascades and/or rock pools during their visit to 'The Cougal's' while 79 percent of visitors (n = 132) claim they specifically noticed the newly placed 'interpretive safety sign' (Figures 7 and 8). (In general, this response in itself is significant as the sign is located on the third viewing platform. The platform is accessed from the main walking track by descending two flights of stairs. It is approximately 400m from the start of the walking track. It is also the platform that overlooks the rock pool where previous spinal injury accidents have occurred). Most respondents said the title and illustration (36%) and the location (29%), [and in some instances the title, illustration and location (9%)] of the sign were factors that attracted them to the sign.

Figure 7: Location of 'interpretive safety sign' on third viewing platform

Figure 8: Visitor reading 'interpretive safety sign'

Most respondents (86%) said the 'interpretive safety sign' was sufficient to advise people (especially young adults), about the dangers of swimming in a natural area. For example:

> *It lets people know what can happen when you injure yourself diving.*
>
> *… it is like a reality check and it keeps running through your head after you've read it.*
>
> *People need to know they are not invincible.*

Seventy-eight percent of swimmers (n = 49) surveyed said they noticed the new 'interpretive safety sign' detailing *Pete's story* (Figure 9). (This result is also significant as swimmers can access the cascades and rock pools by other routes other than the platform where the 'interpretive safety sign' had been installed). This included 63 percent of 17 to 24 year olds (n = 27) and 89 percent of 25 to 34 year olds (n = 19). Eighty-eight percent of the 17 to 24 year olds who read the 'interpretive safety sign' and 88 percent of the 25 to 34 year olds who also read the sign believed the sign was sufficient to advise people about the dangers of swimming in a natural area. Only 14 percent of respondents disagreed by saying the sign needed to be bigger, brighter or duplicated to warn people of the dangers of swimming at this site (6%); *Pete's story* was only one outcome – more specific information or some form of follow-up was required (5%); or some people do not take notice of signs therefore the sign would have no affect on them (3%). (Thirteen percent of respondents aged 17 to 24 and 16 percent of respondents aged 24 to 35 disagreed).

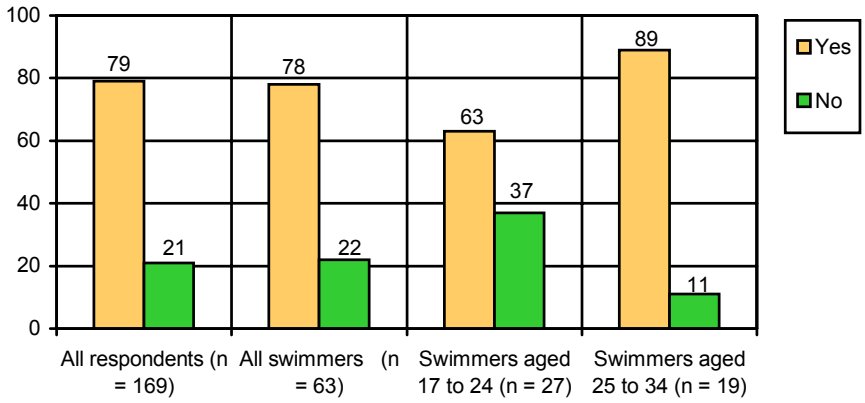

Figure 9: Respondent's reported observation of 'interpretive safety sign' detailing Pete's story

In particular, 38 percent of swimmers (including 32% of 17 to 24 year olds and 39% of 25 to 34 year olds) acknowledged the sign detailing *Pete's story* had actually influenced their decision to swim at 'The Cougal's' (Table 1). This is significant because previous research had established that 91 percent of swimmers (including 97% of 17 to 24 year olds & 92% of 25 to 34 year olds) said they would not change their decision to swim at 'The Cougal's' even if they knew people had been seriously injured swimming here previously (Parkin, 2003).

Table 1: Survey respondents reply to question asking whether the sign detailing *Pete's story* had in any way influenced their decision to swim at 'The Cougal's'

Has the sign detailing *Pete's story* in any way influenced your decision to swim here?	**Average for all swimmers**	17 to 24 years old response	25 to 34 years old response
number of respondents	***63***	*27*	*19*
number of responses	***52***	*22*	*18*
Yes	**38**	32	39
No	**38**	32	50
I did not see / read the sign	**23**	36	11
Please tell me more about your answer			
Yes responses			
number of respondents	***15***	*6*	*6*
number of responses	***15***	*6*	*6*
Makes you more cautious / think twice as accidents can happen	**67**	67	83
Made you check safety of the area (hidden objects, depth, etc.)	**20**	33	17
Other response / comment	**13**	0	0
No responses			
number of respondents	***9***	*2*	*4*
number of responses	***9***	*2*	*4*
I already use caution (I don't jump or dive into water)	**44**	0	50
I know my own ability, wouldn't do it if I thought I couldn't / Accidents happen	**33**	50	50
Other response / comment	**22**	50	0

Swimmers who said 'Yes' and who provided an explanation (n = 15) said the sign had made them more cautious / think twice as accidents can happen (67%), or made them check the safety of the area (20%) before jumping or diving into the water. However, 38 percent of swimmers said the sign did not influence their swimming decision. While it must be noted that most respondents who provided a 'No' response (n = 9) said they already use caution, no respondents in the 17 to 24 year old target group said they did. Responses made by this group tended to infer they saw the sign but did not read it or the same thing would not happen to them! For example:

Saw it but did not read it.

I know my ability and wouldn't do it if I thought I couldn't.

Reasons why swimmers went swimming

Most swimmers (51%) went for a swim at 'The Cougal's' because the amenity of the location appealed to them. That is, they went for a swim because 'The Cougal's' was a nice place, had good scenery, or was an inviting / peaceful / secluded location (Figure 10). However, 29 percent of swimmers said they went for a swim for the experience (of swimming in the cascades and rock pools), because the area had good jumps or for fun.

For approximately half (48%) of all swimmers aged 17 to 24, this was the main reason why they went for a swim at 'The Cougal's'. (In contrast, only 16 percent of swimmers aged 25 to 34 expressed a similar motive). For example:

> *For the experience.*
>
> *I wanted to jump off cliffs.*
>
> *It looked like fun.*

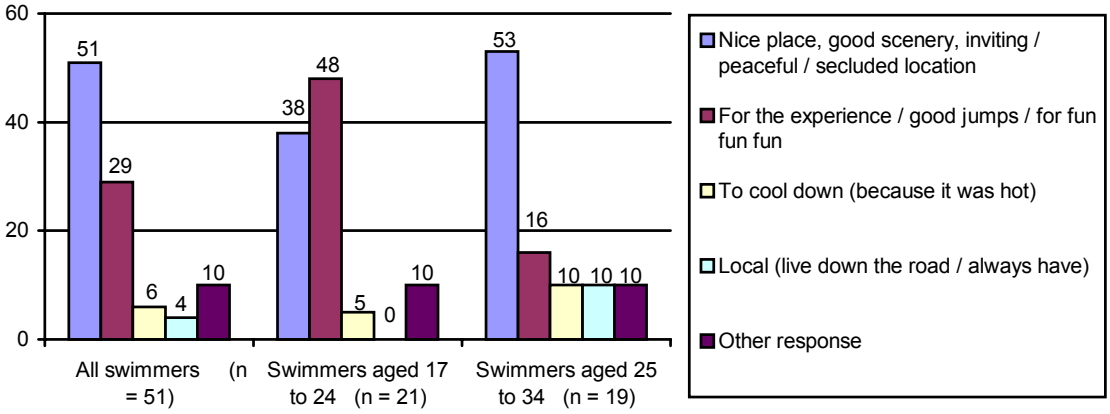

Figure 10: Reasons provided by swimmers to why they went for a swim at 'The Cougal's'

Precautions swimmers took to go swimming at 'The Cougal's'

Although, the two main precautions swimmers took varied (Parkin, 2003), nearly half of all swimmers (46%) said they '*looked for hidden objects under the water*' or, *'did not dive or jump into the water'* and/or '*checked the depth of water before jumping/diving'* into the water (Figure 11). However, 20 percent of respondents said they relied on the actions of other people as their means of ensuring the site was safe for swimming while 16 percent of swimmers took '*no action*', because they had swum there before. Forty-two percent of 17 to 24 year old swimmers said they took appropriate actions to ensure their own safety while 46 percent either took '*no action*' (18%), or action based upon the observance of other people (28%). In contrast, only 23 percent of swimmers aged 25 to 34 took '*no action*' (17%), or action based on the observance of other people (6%) already swimming.

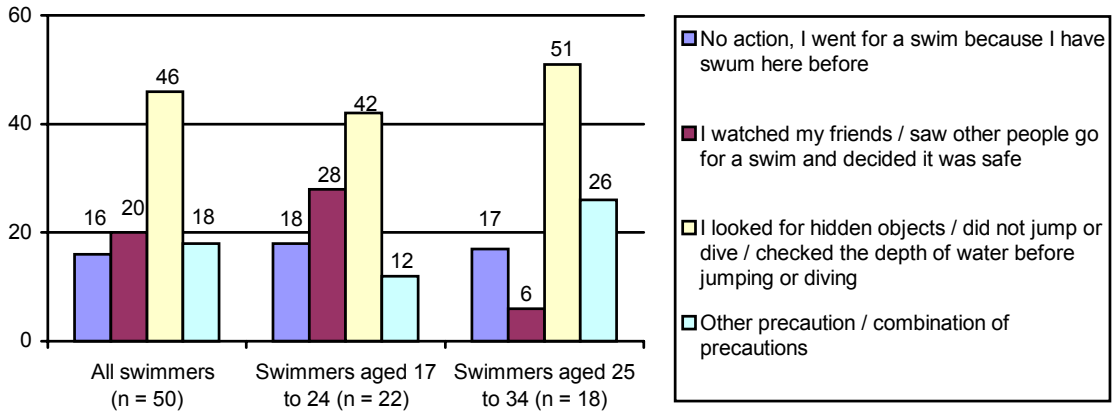

Figure 11: Precautions swimmers took to ensure the rock pools or cascades were safe to swim in

Nonetheless, a comparative analysis of the precautions swimmers took and their claims that the 'interpretive safety sign' detailing *Pete's story* had made them more cautious or check the safety of area first, revealed some inconsistencies in the data collected. For example, only 35 percent of this group (n = 20) indicated they actually exhibited behaviour that was more cautious or ensured their own safety. (This included 29 percent of swimmers aged 17 to 24 and 57 percent of swimmers aged 25 to 34). Thirty percent indicated they relied on the actions of other people as their method of ensuring the site was safe for swimming while a further 25 percent indicated they took '*no action*', even though they claimed the sign detailing *Pete's story* had positively influenced their swimming behaviour.

So, what were our conclusions?

In general, we believe the data collected indicates that the new 'interpretive safety sign' has influenced the awareness of visitors (who read the sign) about the dangers of swimming in natural areas and in particular, the risk-taking propensity of some swimmers in the 17 to 24 and 25 to 34 year old age groups. Data interpretation suggests they are more conscious and/or cautious of the fact that they need to check the safety of the area before they jump or dive into the water. The location and information contained on the sign has contributed to this change in risk-taking behaviour. However, data interpretation also suggests the link between awareness and behaviour is still imperfect. Responses such as: '*accidents happen*', '*I still jumped*' and '*I know my ability and wouldn't do it if I thought I couldn't*' suggests that some swimmers are unlikely to heed the sign's message. Their attitude and risk-taking behaviour will continue to make them susceptible to injury.

We have also learnt that awareness does not necessarily result in preventative behavioural action being adopted. There are factors that determine visitor response that will continue to thwart all efforts of control (Sims & Baumann, 1983; McCool & Braithwaite, 1992). Consequently, there is no guarantee that a protected area visitor will heed or act on the information provided. The abiding conviction that people learn from experience and this experience will evoke preventative measures is also a well-documented misconception (Adams, pers com. 29 Dec 2000; see also Sims & Baumann,

1983:171-173). In most instances, people are misled by their experience because that experience was limited, biased or deceptive and evoked a betraying sense of safety. In addition, an individual's perception of the hazard (magnitude, likelihood and recency of any personal experience of the hazard) will be influenced by the individual's awareness of the hazard, their risk-taking propensity and their perception of control over their fate (McCool and Braithwaite, 1992). Therefore, it is quite likely that the person concerned would have ignored any warning because they were able to form their own view (possibly erroneously) that all was safe for them, at that particular time and place (Beckmann, pers com., 7 Dec 2000; Adams, pers com., 29 Dec 2000).

Nonetheless, protected area agencies should not isolate visitors totally from all hazards they may encounter, or endeavour to "wrap them in cotton wool" (Devery, 1997:61). The objective is to ensure visitors are properly informed of the nature of the hazards and possible implications for their health and well-being. The challenge for the land manager is to find the right combination of information and warnings to allow visitors to make an informed decision of the consequences of their risk-taking behaviour. In this instance, an 'interpretive safety sign' that uses a 'hot' interpretive approach to tell a 'victim's' story is an appropriate means to inform individuals of the consequences of misadventure. It is more personal than the existing onsite signage warning of the dangers of swimming in the cascades and rock pools, and is therefore hoped to be more effective in the management of visitors who choose to swim at this location in the long term. Consequently, this initial trial has been both a success and a pointer to the fact that signs remain an imperfect medium for linking information, awareness and appropriate behaviour. However, time will tell – the trial continues!

References

Ajzen, I. and Fishbein, M. (1980), *Understanding attitudes and predicting social behaviour*, Prentice-Hall, New Jersey.

Beckmann, E. (1995), *Murrumbidgee River Safety Awareness Study 1994/95*, unpublished report prepared for ACTPACS, Canberra, ACT.

Brysland, G. (1997), 'Waiting for Romeo', in *Proceedings of the South East Queensland Rockclimbing and Abseiling Risk Management and Litigation Conference*, Queensland Department of Tourism, Sport and Racing, 23-24 Aug 1997, pp30-59.

Devery, M. (1997), 'Caring for Visitors – The moulding of the Department of Natural Resources Public Safety and Risk Management Policies, in *Proceedings of the South East Queensland Rockclimbing and Abseiling Risk Management and Litigation Conference*, Queensland Department of Tourism, Sport and Racing, 23-24 Aug 1997, pp60-61.

Lackey, B.K. and Ham, S.H. (2003), Contextual analysis of interpretation focused on human-black bear conflicts in Yosemite National Park, *Applied Environmental Education and Communication*, v2, n1, pp11-21.

McCool, S.F. and Braithwaite, A.M. (1992), Persuasive messages and safety hazards in dispersed and natural recreation settings, in Manfredo, M. (ed), *Influencing Human Behaviour*, Sagamore Publishing Inc, Champaign, Illinois, pp293-326.

Parkin, D.R. (2003), '*The Cougal's' Water Safety Awareness Study*, unpublished report prepared for Kim Morris, Senior Conservation Officer (Interpretation), Queensland Parks and Wildlife Service, Boonah, Qld.

QPWS (2001), *Draft Sign Manual*, internal document, Queensland Parks and Wildlife Service, Brisbane, Qld.

QPWS (2002), *Mt Cougal section Springbrook National Park Concept Plan Discussion Paper*, internal document, Queensland Parks and Wildlife Service, Brisbane, Qld.

Roggenbuck, J.W. (1992), Use of persuasion to reduce resource impacts and visitor conflicts, in Manfredo, M. (ed), *Influencing Human Behaviour*, Sagamore Publishing Inc, Champaign, Illinois, pp149-208.

Sims, J.H. and Baumann, D.D. (1983), 'Educational programs and human response to natural hazards', in *Environment and Behaviour*, Vol. 15, No. 2, pp165-189.

Tilden, F. 1997, *Interpreting our Heritage*, 3rd edn, The Uni of North Carolina Press, USA.

Uzzell, D.L. 1989, "The hot interpretation of war and conflict" in *Heritage Interpretation*, Vol.1, Belhaven Press, New York.

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