



Interpretive media that attract park visitors and enhance their experiences: A comparison of modern and traditional tools using GPS tracking and GIS technology

Isabelle D. Wolf ^{a,*}, Heidi K. Stricker ^b, Gerald Hagenloh ^a

^a NSW National Parks and Wildlife Service, Office of Environment and Heritage, Department of Premier and Cabinet, Hurstville, NSW 2220, Australia

^b School of Biological, Earth and Environmental Sciences, University of New South Wales, Sydney, NSW 2052, Australia

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ABSTRACT

Advances in technology have expanded the range of media available for interpretation in parks however their effectiveness in nature-based settings has not been well established. This study compared the performance of modern technical media, namely a GPS-triggered multi-media tour and an MP3-player audio tour, with traditional media: text-rich versus image-rich pamphlets and signs. Performance was evaluated by a questionnaire-based survey along with GPS tracking of visitors who used the different media along a scenic walking track in an Australian national park. The GPS tracking proved to be an efficient and versatile tool to ascertain three performance measures for interpretive media, specifically, the attracting, holding and distracting powers of interpretive media. The latter is defined first in this study as their power to encourage people to visit attractions off the main path.

The GPS navigation tour performed well compared to traditional media in achieving an intermediate attracting power, the highest distracting power and the highest holding power. Compared to the audio tour, it was rated more highly for the overall experience with the medium and for facilitating fun. Further, visitors were more willing to provide word-of-mouth recommendation for the GPS navigation tour. Both modern media achieved the highest satisfaction ratings for discovery and learning and were most efficient at facilitating factual learning.

Traditional media were more conducive to socialising and more relaxing and consistent with a nature-based experience. Signage outperformed pamphlets by achieving stronger attracting and holding powers, higher overall satisfaction with the medium and greater word-of-mouth recommendation. The minor differences between image-rich and text-rich media were that the former received a higher satisfaction score for facilitating a fun experience but it achieves a lower degree of factual learning.

Whilst our study demonstrated that modern technical media can be effective tools for park interpretation, traditional media continue to play an important role in nature-based experiences without the intrusion of technology.

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1. Introduction

Effective interpretation is an important tool for park managers in attracting visitors and enhancing their experiences in national parks (Light, 1995; Moscardo, Woods, & Saltzer, 2004; Tubb, 2003). Park interpretation aims to educate and increase visitor appreciation and awareness of the cultural and natural heritage aspects of a specific site (Hughes & Morrison-Saunders, 2002a; Hwang, Lee, & Chen, 2005), and fosters place attachment and identification with a park (e.g., Ballantyne, Packer, & Beckmann, 1998; Brody, Tomkiewicz, & Graves, 2002). Successful park interpretation draws visitors away from competing leisure attractions and encourages return visits to sites where people experienced high levels of satisfaction (e.g., Bramwell & Lane, 1993). The latter may result in tourists recommending the tour to others which is an important means to attract new visitors (Munro,

Morrison-Saunders, & Hughes, 2008). Additionally interpretation is an appropriate tool for guiding visitors in space and time enabling them to select places or features within the park that may be particularly attractive or meaningful to them (Bramwell & Lane, 1993).

Given that there is a range of interpretive media available and that interpretation programs are costly to implement and maintain, it is imperative that research is undertaken to evaluate and identify the most effective media for a specific recreation setting (Light, 1995; Munro et al., 2008). Numerous studies have assessed interpretive media in indoor settings such as galleries, museums and visitor centres (e.g., Alt & Shaw, 1984; Moscardo & Pearce, 1986; Peart, 1984; Screven, 1976; Washburne & Wagar, 1972). In contrast, far fewer studies have evaluated interpretive media for outdoor settings such as national parks (e.g., Brody et al., 2002; Light, 1995; Ruchter, Real, & Döpmeier, 2005). The results of studies from indoor settings are not always applicable outdoors where interpretive media need to be particularly effective at competing with a multitude of random sensory stimuli from the environment and visitors' need to pay attention as they travel along

* Corresponding author. Tel.: +61 4 0330 3550; fax: +61 2 9585 6601.

E-mail address: i.wolf@online.ms (I.D. Wolf).

recreational tracks and explore sites (Hughes & Morrison-Saunders, 2002a; Rademaker, 2008). In addition to this, people's motivation to learn and therefore their incentive to engage with interpretive media may be greater in museums and other educational indoor settings (Light, 1995; Novey & Hall, 2007).

We focus on the evaluation of self-guided, traditional (pamphlets, signage) vs. modern (audio MP3 tours, GPS-triggered multi-media tour) media for a walking trail in a well-frequented national park in the Sydney metropolitan area. GPS-triggered multi-media tours can be delivered via smart-phone applications or on GPS navigation devices as points of interests (POIS). Both technologies have become very popular to retrieve location-based information whilst travelling and compared to others, radio-frequency identification systems (Ferrer, Dew, & Apte, 2010) for example, they are comparatively easy to provide as the user supplies the equipment rather than park management. This is a particular advantage for large park systems where many parks need to be serviced with appropriate interpretive information.

The central question in our paper is how modern technical media compare to traditional media as tools for park interpretation. We hypothesised that people prefer traditional media over modern media as the technicality of the latter may distract from the outdoor experience in the natural environment, which is a major motivation to visit national parks. However, modern media were expected to enhance short-term factual learning and to have a higher holding power as they likely increase visitor's attention span.

To evaluate the effectiveness of the different media types we used a questionnaire-based survey in combination with the GPS tracking of visitors, which is a comparatively new and insightful technique that generates high-precision data on visitor movements (Shoval & Isaacson, 2007; Wolf, Hagenloh, & Croft, 2012). To our knowledge this is the first study that compares the performance of interpretive media based on an in-depth evaluation of spatio-temporal visitor data. We provide insights into the effectiveness of GPS tracking and GIS for such an evaluation process and how well this approach complements more traditional techniques. Our study exemplifies how the implementation of GPS tracking and GIS technology is crucial to generate reliable and novel performance measures that assist park management in decision-making on the types of interpretive experiences that best meet their requirements.

2. Literature review

2.1. Range of interpretive media

When implementing interpretive programs along recreational tracks, there is a range of self-guided interpretive media available from which park managers can choose. Museum studies have shown that people actively engage with interpretive media and that the way material is communicated to them influences their level of absorption (McManus, 1988, 1989). People may briefly read parts of interpretive text in order to confirm the 'predicted' meanings of the object which is being interpreted (McManus, 1989), and to decide whether to further engage with the object and the interpretive medium itself.

Print media such as pamphlets and trail-side interpretive signage that alert and inform visitors of park attractions are traditionally used. Pamphlets have proved to be effective tools for conveying information to park visitors (Andereck, 2005; Brody et al., 2002; Moscardo et al., 2004). They are useful as they can be read at any time during the walk and retained for later reference (Moscardo et al., 2004). Pamphlets may also be perceived as less visually polluting or distracting than signage which is permanently installed in the environment. In contrast, interpretive signage, another common means for visitor interpretation, provides access to information at a specific location of interest (Moscardo et al., 2004). Signage is known to enhance self-guided trails and allows visitors to move at their own

time and pace (Moscardo et al., 2004). In comparison with modern technical media, print media pose no technical difficulty that may distract visitors from enjoying their tour (Light, 1995). However, a noted drawback of signage may be its inadequacy of interpreting fauna wherever wildlife sightings occur randomly in space (Moscardo et al., 2004).

There are also other aspects of traditional media that may reduce the quality of the visitor experience. For example users of pamphlets may need to rely on a map to find the location of interest, whereas no such additional effort is required for other interpretive media (Ruchter et al., 2005) such as GPS-triggered multi-media tours. Even with interpretive signage, visitors have a chance to engage with panels that they have discovered serendipitously by following a marked track. Given that visitors can opt to read pamphlets at the sites which they interpret or elsewhere, may entail that people do not read the content at all or miss out on a possibly more engaging and memorable form of on-site interpretation.

An important choice in print media relates to the presentation of information because quantity and layout of text and the number and size of images significantly influence their effectiveness (Bitgood, 2000; Cole, Hammond, & McCool, 1997; Hughes & Morrison-Saunders, 2002a; Moscardo, 1999b). Such design features should be optimised to maximise attention span in visitors (Bitgood, 2000; Cole et al., 1997; Ham, 1992). According to Bitgood (2000) "... capturing visitor attention is the first step in the interpretive process. Visitors must first pay attention to a label before it has any chance of delivering an interpretive message". High-intensity use of signage on trails may result in information overload and visual pollution as evidenced by previous studies (Bramwell & Lane, 1993; Cole et al., 1997; Hughes & Morrison-Saunders, 2002a, 2005). In the pursuit of enhanced visitor satisfaction and short term retention of new facts, there is a fine balance between the number and size of panels and any resulting visual impacts (Hughes & Morrison-Saunders, 2002a,b, 2005).

Recent advances in park interpretation include the use of modern technical media that deliver auditory and visual (text, imagery) tour content via conventional MP3 players or multi-media tools such as GPS navigation devices and smartphones. These tours may be very attractive to visitors as they are novel, multi-sensory and audio-visual and require the least amount of effort for consuming interpretive information (Light, 1995; Moscardo, 1996). There is evidence that people are more responsive to dynamic multi-sensory and interactive experiences, which enhance visitor learning and satisfaction levels (Light, 1995; Moscardo, 1996; Novey & Hall, 2007; Rademaker, 2008). Modern media that include an audio component can be particularly effective at raising the attention span of visitors leading to higher levels of engagement than traditional media (Light, 1995; Novey & Hall, 2007; Peart, 1984). For example Davidson, Lee, and George (1991) found that for a museum exhibit 72% of visitors listened to the recorded labels as opposed to 34% who read them.

Given the diverse range of visitors and ages that utilise national parks, park management needs to decide on the level of control and technicality of the device such as a manual or automatic trigger of audio tour content (Moscardo, 1996; Rademaker, 2008). An automatic trigger assists in locating tour stops (Ruchter et al., 2005), and may encourage people to explore sights which they may have otherwise missed. However, it may also diminish the joy of discovery and inhibit visitors' choice of path (Rademaker, 2008; Ruchter et al., 2005). In addition, some people may react negatively to the loss of autonomy to decide whether or not to trigger the tour and therefore experience lower levels of satisfaction (Rademaker, 2008).

Although the novelty of modern media may be very attractive to some visitors, others may consider them in conflict with the naturalness of the visitor experience in a national park. Whilst GPS navigation devices may be considered less visually and physically intrusive than a sign, the audio components may conflict with visitors who seek a quiet walk away from urban noise. Simply dealing with the

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