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A Method for Testing the Effect of Management Interventions on the Satisfaction and Loyalty of National Park Visitors

ROSS H. TAPLIN, KATE RODGER, AND SUSAN MOORE

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Ross H. Taplin, Kate Rodger, and Susan Moore
A Method for Testing the Effect of Management Interventions on the Satisfaction and Loyalty of National Park Visitors

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Providing visitors with satisfying experiences is integral to park management. Research has inferred the determinants of satisfaction and loyalty through theorizing, observational studies, and statistical correlations. This article advocates randomized experiments as a complementary method for testing the causal effect of selected management interventions that change service quality on satisfaction and loyalty. An experiment using ranger presence and enhanced toilets in a West Australian national park is used to illustrate the approach. The presence of rangers caused significantly improved satisfaction with rangers, related service quality attributes, and overall satisfaction, but not loyalty. Enhancing toilets had nonsignificant impacts. These results strongly suggest the need for further visitor-focused experimental research to complement the growing body of research in national parks investigating the complex relationship among service quality, satisfaction, and loyalty.

Keywords causality, experimental research, national park visitors, randomized experiment, satisfaction, service quality, visitor loyalty

Introduction

National parks and other protected areas conserve species and ecosystems as well as provide for compatible visitor opportunities (International Union for the Conservation of Nature...
Visitor satisfaction with experiences in parks and other protected areas has been theorized as being strongly influenced by the facilities and services offered (Arabatzis & Grigourodis, 2010; Fletcher & Fletcher, 2003; Lee, Graefe, & Burns, 2004, 2007; Rivera & Croes, 2010; Ryan & Cessford, 2003; Tian-Cole, Crompton, & Wilson, 2002; Tonge, Moore, & Taplin, 2011; Wade & Eagles, 2003). This relationship, between facilities and services, and satisfaction and more recently loyalty, has its theoretical origins in marketing research (Parasuraman, Zeithaml, & Berry, 1985) and has been widely tested using visitor data collected from observational studies accompanied by statistical analyses. Tian-Cole, Crompton, and Wilson (2002), in their seminal paper, collected data through surveying visitors to a wildlife refuge. They found statistically significant relationships between facility and service attributes (e.g., brochures about the refuge, cleanliness of restrooms, staff/volunteers’ willingness to help visitors) and the constructs of satisfaction and behavioral intentions.

Observational studies, usually directed toward the testing of theory and accompanied by statistical analyses, have been used in a number of other studies of visitors to protected areas, in addition to the research by Tian-Cole et al. (2002) (e.g., Fletcher & Fletcher, 2003; Kyle et al., 2004; Lee et al., 2004, 2007; Rivera & Croes, 2010). Service quality and satisfaction have been noted as significantly influencing the behavioral intentions of visitors to Umpqua National Forest in Oregon (Lee et al., 2004) and to the Galapagos Islands (Rivera & Croes). In both studies, satisfaction had a significant mediating influence between quality and intentions. Fletcher and Fletcher, in a detailed analysis of service quality attributes through surveys of visitors to Florida’s state parks, found that visitor satisfaction was strongly predicted by the training and behavior of park personnel and the maintenance and cleanliness of the park.

Causality in these studies follows the probabilistic model of causation that is standard practice in social research using observational data (Vaske, 2008), where the design is embedded in theory testing or building. Structural equation modeling has been an increasingly popular statistical technique (e.g., del Bosque & San Martin, 2008; Lee et al., 2004; Tian-Cole et al., 2002; Zabkar et al., 2010). In such modeling, service quality has been an assumed determinant of satisfaction and/or behavioral intentions when these are correlated. However, a way to further explore this assumption is through experimentally manipulating one or more of the service/facility items and measuring the influence on the dependent variables (i.e., on satisfaction and behavioral intentions/loyalty). As Chi (2012, p. 22) commented in concluding her observational study of visitors to a major tourism destination in the southern United States, “it may be useful to manipulate factors of interest experimentally, thereby enabling more definite conclusions about causal relationships to be drawn.”

While such an approach is widely applied in scientific research and statistics (Ramsey & Shafer, 2002), field-based manipulation of management attributes (i.e., experiments)
is rare in leisure and recreation research. As such, the aim of the study reported was to
design a randomized experiment as a method for experimentally testing the causal effect
of management interventions that change service quality on satisfaction and loyalty. An
experiment using ranger presence and enhanced toilets in a popular West Australian national
park is used to illustrate the approach.

Literature Review

Substantial research efforts have been undertaken in the last three decades to provide greater
conceptual clarity regarding service quality and visitor satisfaction, and the relationships
between them (e.g., Tian-Cole & Crompton, 2003). Visitor loyalty is a more recent addition
to these considerations (Kyle et al., 2004; Moore, Rodger, & Taplin, 2013; Weaver &
Lawton, 2011). These efforts can be found in the tourism, recreation, and leisure fields, as
well as in marketing and consumer behavior (Tian-Cole & Crompton, 2003).

The saliency of this theorizing to visitor research in protected areas moderated the
choice and inclusion of material in this review. The central intent of this review is to
investigate and contribute to our understanding regarding the “structural relations” (Kyle
et al., 2004) among service quality, satisfaction, and loyalty. We return to potential future
contributions of experimental approaches, such as the one taken in this study, to enhancing
our theoretical understanding of these structural relations in the Discussion section.

Service Quality, Satisfaction, and Loyalty

Conceptual confusion between service quality and satisfaction has been a significant issue
due to both being grounded in expectancy-disconfirmation theory (Baker & Crompton,
2000; Lee et al., 2004; Moore et al., 2013; Tian-Cole & Crompton, 2003). This theory
explains service quality as the gap between expectation and perception (Parasuraman et al.,
1985) and satisfaction as the process of meeting or exceeding expectations (Oliver, 1980).
Since service quality and satisfaction share this common theoretical origin, overlaps in
definition and an ongoing lack of consensus regarding their operationalization have proved
problematic. Today, however, most researchers agree that the two concepts are distinct
(Lee et al., 2004; Moore et al., 2013; Tian-Cole & Crompton, 2003). Service quality is
regarded as cognitively based, and is a specific judgment of services available (Baker &
Crompton, 2000; Parasuraman et al., 1985; Tian-Cole et al., 2002; Tian-Cole & Crompton,
2003; Zabkar et al., 2010) while satisfaction is an evaluation of experiences (Crompton &
Love, 1995; del Bosque & San Martin, 2008; Tonge & Moore, 2007; Zabkar et al., 2010).

The SERVQUAL instrument developed by Parasuraman, Zeithaml, and Berry (1988)
has been widely used to evaluate service quality, with its conceptual underpinnings, rather
than the means and methods of measurement, of relevance to this literature review. The
instrument conceptualizes service quality as the gap between perception and expectation
of service, hence the term expectation-disconfirmation. The usefulness of measuring both
expectations (importance) and perception (performance) has been highly contested, with
scholars such as Absher (1998) using performance-only measures and more recently Taplin
(2012a) illustrating that both measures provide essential information for judging service
quality. As such, in this study we rely on expectation-disconfirmation theory as an underpin-
ning for the measurement of both expectations (importance) and perception (performance).
We report the results separately, rather than combining them to provide a single measure
of service quality, to avoid entering the contested space of the relative value or efficacy of
the two measures.

Lee et al. (2004) suggested that rather than replicating SERVQUAL for use in forest
settings, and in the case of this research, a national park, specific adaptation of concepts is

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needed. Over the subsequent decade a number of researchers have developed lists of items of immediate relevance to protected areas. Visitors have been asked for their perceptions of the performance of facilities such as restrooms, signposts, walk trails and car parks, and services such as the friendliness of staff and guided tours (e.g., Arabatzis & Grigoroudis, 2010; Ryan & Cessford, 2003; Tonge & Moore, 2007; Wade & Eagles, 2003; Zabkar et al., 2010). We have been guided by Lee et al. (2004) in our choice of service quality items for evaluation.

Regarding satisfaction, there seems widespread agreement that it is affective and experience-based (Brown, 1988), in contrast to the more cognitively constructed and judged service quality. It is an evaluation of experiences (Crompton & Love, 1995; del Bosque & San Martin, 2008; Tonge & Moore, 2007; Zabkar et al., 2010). Baker and Crompton (2000, p. 788) noted how “satisfaction may be influenced by the social-psychological state a tourists brings to a site (mood, disposition, needs) and by extraneous events (for example climate, social group interactions) that are beyond the provider’s control, as well as by the program or site attributes that suppliers can control.”

Related theorizing by Crompton and colleagues (e.g., Tian-Cole et al., 2002; Tian-Cole & Crompton, 2003) places the emphasis on overall satisfaction as an affective measure and its relationship with individual service quality attributes. This emphasis is also adopted in this study. Visitor satisfaction as a global attitude places it super-ordinate to service quality, suggesting investigation of the latter as an antecedent of the former (Baker & Crompton, 2000; Lee et al., 2004; Tian-Cole & Crompton, 2003). Measurement of overall visitor satisfaction has been central to visitor research for protected areas (Bushell & Griffin, 2006; Crilley, Weber, & Taplin, 2012; Dorfman, 1979; Lee et al., 2004; Moore et al., 2013; Taplin, 2012b; Tian-Cole et al., 2002; Tonge et al., 2011).

Over the last two decades in marketing research and related fields, including leisure studies, interest has shifted from satisfaction to loyalty, and its companion behavioral intentions, as a better predictor and measure of performance (Chi & Qu, 2008). Much of this attention is directed to behavioral intentions, which are a person’s stated intention to perform particular behaviors. Behavioral intentions are assumed to be a predictor of actual behavior so can be used to predict visitors’ behaviors with respect to the protected area postvisit. Tian-Cole and Crompton (2003) describe how a visitor’s intention to visit a destination and related destination-oriented intentions (such as donating money to its management) are determinants of their actual behavior with respect to the destination.

The behavioral intentions of visitors to protected areas have been studied in a wildlife refuge in Texas (Tian-Cole et al., 2002), Umpqua National Forest in Oregon (Lee et al., 2004; 2007), South Carolina’s Francis Beidler Forest (Weaver & Lawton, 2011), with Appalachian Trail users (Kyle et al., 2004), and the Galapagos (Rivera & Croes, 2010). A gradual shift in terminology has taken place, from behavioral intentions (e.g., Tian-Cole et al., 2002) to loyalty (e.g., Lee et al., 2007; Weaver & Lawton, 2011), however, the items deployed to measure these constructs have remained constant for most of this time.

All these studies are examples of a focus on the conative (intention-related) elements of loyalty. Oliver (1999) also identified attitudinal and behavioral loyalty in his model of loyalty formation. Only a handful of protected area studies have investigated all three elements. Attitudinal loyalty has been studied for protected areas using the theoretical lens of place attachment (Kyle et al., 2004; Lee et al., 2007; Weaver & Lawton, 2011). Behavioral loyalty has been measured by asking visitors to record their visitation levels (Lee et al., 2007). In line with the majority of recent research into visitor loyalty, this study investigates conative (i.e., intention-related) loyalty, while being cognizant of the other elements in Oliver’s (1999) model. Items reflecting our interest in conative loyalty are central to this study’s hypotheses.
The consistent, core items of conative loyalty include saying positive things about the destination to others; recommending the destination to others; and intention to revisit (Baker & Crompton, 2000; Lee et al., 2004; Lee et al., 2007; Tian-Cole et al., 2002). In recent years, other items have been included such as willingness to pay higher entrance fees, willingness to donate money, willingness to volunteer time, and willingness to advocate on behalf of the destination (Ramikisson, Smith, & Weiler, 2013; Weaver & Lawton, 2011). These last three items are shared with more general research efforts into pro-environmental behaviors: actions undertaken by individuals or groups either promoting or resulting in the sustainable use of natural resources (Halpenny, 2010). In line with this shift in terminology, the term “loyalty” was used in this study to encompass the suite of behavioral intentions relevant to protected areas as destinations.

Relationships Among Service Quality, Satisfaction, and Loyalty

The principle points of attention in leisure and tourism research and associated theoretical and empirical investigations, in terms of understanding the influences on visitors’ experiences and loyalty, have been the constructs of service quality, satisfaction, and loyalty (Baker & Crompton, 2000; Chi & Que, 2008; Moore et al., 2013) and their structural relations (Kyle et al., 2004). This comment is equally as salient to visitor research in protected areas (Fletcher & Fletcher, 2003; Lee et al., 2004; Rivera & Croes, 2010). Improving service quality has been widely hypothesized as creating more satisfied visitors who are more loyal (i.e., ones who will return and recommend to others) (Kyle et al., 2004; Lee et al., 2004, 2007; Ramikisson et al., 2013; Rivera & Croes, 2010; Tian-Cole et al., 2002).

Theorizing and associated observational studies over the last decade posit strong relationships between service quality and both satisfaction and loyalty behaviors (Kyle et al., 2004; Lee et al., 2004, 2007; Ramikisson et al., 2013; Rivera & Croes, 2010; Tian-Cole et al., 2002). Tian-Cole, Crompton, and Wilson (2002), for example, using structural equation modelling, concluded that service quality contributed to overall satisfaction and future behavioral intentions. Lee et al. (2004) reported that service quality (comprising three factors: staff and information, e.g., “friendly rangers”; health and cleanliness, e.g., “cleanliness of toilets”; and facilities, e.g., “facility compatible with environment”) is an antecedent of satisfaction (overall enjoyment, value for money, dissatisfaction) as well as having a direct effect on behavioral intention (positive word of mouth, long- and short-term intention to revisit). They note that satisfaction plays a mediating role between service quality and behavioral intentions. Rivera and Croes (2010, p. 95) concluded from their Galapagos study that “perceived quality, perceived value and customer satisfaction appeared to have a significant impact on the customer’s ‘intent to recommend’” (i.e., loyalty). Researchers continue to be challenged by the potential array of variables influencing satisfaction. Crompton, MacKay, and Fesenmaier (1991, p. 16) make the following important observation:

It is likely that level of service delivery will be highly correlated with amount of satisfaction, but there are other variables that may intervene. For example, the service provider may perform well but the consumer may perceive that it costs too much, or the social group with whom he or she is participating may be inadequate in some way, or the consumer may not be in a receptive mental state of mind or physical condition to derive a high level of satisfaction from the outcome, or the weather may be detrimental.

Other influences on visitor satisfaction and loyalty with respect to their use of protected areas and included in theorizing and associated testing through observational studies include
value for money (Rivera & Croes, 2010), destination image and travel infrastructure (Chi, 2012), involvement in activities (Lee et al., 2007), and place attachment (Kyle et al., 2004; Lee et al., 2007; Weaver & Lawton, 2011).

The conclusions regarding relationships between service quality, satisfaction and loyalty are all derived from theorizing, and observational studies and associated statistical correlations. Although such theorizing based on extensive syntheses of the literature and past empirical efforts (almost exclusively observational in nature) and sophisticated statistical techniques such as regression and structural equation modeling may be applied, it is not fully possible to prove causal relationships in these ways. Scientific research, based on statistically designed experiments, is required if causality is to be rigorously tested (Ramsey & Shafer, 2002).

**Experimental Research of Visitors’ Experiences in Parks and Other Protected Areas**

Scientific research into visitors’ experiences in parks, based on randomized experiments with satisfaction and/or loyalty as dependent variables, is virtually nonexistent. There are, however, two studies that contribute to design considerations. Daniels and Marion (2006) examined visitors’ reactions to changes in camping management including the moving of camping to newly constructed sites. Although it was not based on a randomized experiment, they were able to conduct surveys before and after the management intervention. They also analyzed satisfaction, a central interest in the study reported in this article, which revealed visitors were more satisfied with all social and environmental indicators after the changes. However, overall satisfaction did not change. The approach taken in their study was quasi-experimental being based on a before-after design, rather than experimental, meaning other factors could have influenced the results. Questions relating to loyalty were not included.

The other study of direct relevance to the study reported in this paper, in terms of its design, is a randomized experiment conducted by Park, Manning, Marion, Lawson, and Jacobi (2008) in Acadia National Park in Maine (United States). These researchers undertook intervention research to study the effectiveness of alternative management practices in Acadia. A randomized experiment including treatments and controls was used to examine five different management techniques designed to keep visitors on maintained trails. Using observation and visitor surveys they found all management practices reduced the number of visitors who walked off trail. Their study was primarily focused on management of environmental impacts and did not examine effects of the changes on visitor satisfaction or behavioral loyalty. More importantly, it is one of the only such studies to implement a rigorous experimental approach including controls and experimental treatments.

Interpretation research has a robust history of interventions in park management to evaluate the efficacy of particular actions. The early research by Swearingen and Johnson (1995) at Mount Rainier National Park, Washington, where the effectiveness of written materials versus a ranger presence was tested is an early example from this body of research. More recently, Steckenreuter and Wolf (2013) used a randomized experiment, with a control and two experimental treatments, to test the contribution of persuasive information to visitors’ acceptance of fee payment to enter a popular site in Greenbrier State Park in western Maryland. This latter study illustrates how randomized experiments can be conducted but did not focus on satisfaction or loyalty that were the dependent variables.

To be effective and efficient experimental research addressing visitors’ experiences in protected areas must focus on attributes that are both able to be managed (i.e., improved, manipulated) and are important to visitors. A number of studies of service quality in protected areas over the last decade suggest a focus for interventions, through identifying
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the attributes of most importance to visitors. The cleanliness of toilets/restrooms is an almost universal concern identified in studies in the United States, (Fletcher & Fletcher, 2003), New Zealand (Ryan & Cessford, 2003), Africa (Wade & Eagles, 2003), and Australia (Crilley et al., 2012; Tonge et al., 2011). Fletcher and Fletcher (2003, p. 21) suggested that park maintenance and park personnel are sufficiently important to visitors to be the sole focus of management attention, with “measurable and documentable increases in park visitor satisfaction” achieved. In Rivera and Croes’s (2010) study of ecotourists at the Galapagos, for the nine performance items measured, the perceived performance of professional staff had one of the highest means, along with the hospitality of the local community and the range of activities offered. The results from these previous studies emphasize the importance of the performance of restrooms and staff to visitors and therefore the potential suitability of these two elements of service quality for experimental manipulation.

Methods

The study site was Yanchep National Park, with an area of about 3,000 ha and located 50 km north of Perth, the capital city of Western Australia. Numerous recreational attractions are available including picnic areas, underground caves, guided tours, koala viewing enclosures, and a variety of tracks and trails (DEC, 2008). The central area of the park, where most visitor activities are concentrated, is a highly modified, extensive day-use picnic area with large expanses of grass, picnic tables and barbeques. The park attracts approximately 280,000 local, interstate, and international visitors each year. Visitors tend to be local residents, accompanied by children, family, or friends, who have visited previously, and spend half to a full day in the park (DEC, 2011). This park was selected for several important logistical reasons: it was readily accessible to the researchers; the researchers had a strong longstanding research relationship with the Western Australian Department of Parks and Wildlife (the managing agency), making intervention research possible; and the picnic area provided a relatively contained site where interventions could be undertaken with a high confidence that most visitors would experience the interventions.

Questionnaire Content

The survey began with questions on trip specific characteristics. These questions were sourced from the WA Department of Parks and Wildlife’s state-wide survey (Moore et al., 2009). Visitor demographics were measured (and coded for analysis) as follows. The number of visits to the park was measured as: first visit (1), second visit (2), three to five visits (3), six to ten visits (4), and more than ten visits (5). Intended time spent in the park was measured as less than 2 hours (1), between two and four hours (2), and over 4 hours (3). Age of visitor was measured as 18–24 (1), 25–34 (2), 35–44 (3), 45–54 (4), 55–64 (5), and 65 or older (6). The number of adults in the visitor’s group was truncated at 10. The three variables—children present, WA resident, and international resident—were recorded as no (1) or yes (2) if children were present in the visitor’s group, the visitor resided in the state of Western Australia, and resided outside Australia.

Visitors were asked to assign a level of importance and performance (worded as “satisfaction” in the questionnaire) to nine service quality attributes. These attributes are widely used in park visitor surveys (Griffin, Moore, Crilley, Darcy, & Schweinsberg, 2010; Horneback & Eagles, 1999) and included a number related to the selected interventions. A 7-point Likert scale was used with 1 being the lowest (not at all important/not at all satisfied) and 7 the highest (extremely important/extremely satisfied).
The two attributes, ranger presence and enhancement of toilets, were chosen as interventions for this study because, as noted above in the Literature Review, past research has previously identified park personnel and park maintenance as strong predictors of satisfaction (Fletcher & Fletcher, 2003). Park facilities such as restrooms are often highlighted as having poor performance (e.g., Ryan & Cessford, 2003; Wade & Eagles, 2003), making them a logical choice for intervention research. Previous visitor research in this National Park showed that both these attributes were important to visitors (Tonge et al., 2011) and both were practically able to be manipulated for the purposes of this research.

Three questions on overall visitor satisfaction derived from del Bosque and san Martin (2008) and measured on a 7-point Likert scale from 1 (strongly disagree) to 7 (strongly agree) were also included. Following this were eight questions measuring the likelihood of loyalty behaviors, measured on a scale from 1 (very unlikely) to 7 (very likely). These conative loyalty questions were derived from Tian-Cole et al. (2002), Halpenny (2006), Lee et al. (2007), Nowacki (2009), and Wang, Zhang, Gu, and Zhen (2009).

Survey Design

Surveying was conducted onsite in the Park on Saturdays and Sundays over autumn 2012 for a total of eight days. Weekends were chosen for sampling after discussion with Park staff and due to greater visitor numbers on weekends compared to weekdays. Four treatments were randomly allocated to two of the days each. The four treatments were (1) no rangers present and no enhancement to toilets (the control), (2) rangers present and no enhancement to toilets, (3) no rangers present and enhanced toilets, and (4) rangers present and enhanced toilets. Statistically, these treatments collectively constitute a balanced $2 \times 2$ experimental design with two replicates. Importantly, this is the experimental basis of this study, with the eight days giving a sample size of eight.

On the ranger intervention days, up to two park rangers were visible and interacted with visitors. They were present throughout the central picnic area of the Park between 11am and 3pm, stopping to talk with as many visitors as possible. During the same time period the researchers moved through the park surveying visitors. Surveying was not undertaken immediately after visitors had interacted with the ranger but took place some time during the hours of 11am and 4pm. For some visitors the interaction with a ranger was only for a few minutes while for others it lasted for up to 15 minutes, with the rangers answering questions and providing information on the park. The length of the interaction was not important, rather the interaction itself was evaluated. On the days when rangers were absent they remained out of sight from visitors in the central picnic area between 11am and 4pm.

For the second intervention the toilet facilities were enhanced by placing vases with artificial flowers at the entrance of each of the toilet amenity buildings as well as hand pump soap and scented fragrance diffusers next to the washbasins. In the picnic area there are four such buildings and all were included in this study. All four buildings were checked on an hourly basis by the researchers, with rubbish removed and floors and other infrastructure cleaned as required. On the days of no enhancement the toilet facilities were left unchecked and not cleaned, apart from the normal park maintenance of a Friday evening clean.

Researchers would ask all adults if they would mind completing the survey. If they agreed a clipboard, survey and pen were left with them and then collected approximately 10–15 minutes later. All adult visitors the researchers encountered were surveyed. While multiple visitors within the same group might be surveyed, each visitor completed the survey separately and our regression analysis is applied to average visitor responses for
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Hypotheses

Possible effects of the interventions were tested for four sets of responses: importance of each attribute (H1), performance of each attribute (H2-H4), overall satisfaction (H5-H6), and loyalty (H7-H8). These hypothesized relationships are detailed in Table 1. The constructs (e.g., service quality), items used to measure each construct (e.g., presence of rangers), and the relationships between them presented as hypotheses are based on expectation-disconfirmation theory (Oliver, 1980; Parasuraman et al., 1985) and Oliver’s (1999) model of loyalty formation. These have been interpreted, mediated and further developed by researchers such as Baker and Crompton (2000), Tian-Cole and Crompton (2003), Kyle et al. (2004), Lee et al. (2004, 2007), and Weaver and Lawton (2011), and as detailed in the Literature Review. Due to the statistical design of this study, and in particular the randomization of treatments, conclusions concerning these hypotheses involve causal relationships rather than associations between variables as described in past literature.

Statistical Analysis

In accordance with the statistical design, analysis was conducted using days as the experimental unit rather than visitors. This is because the treatments were randomly allocated to days rather than individual visitors. While analyzing days rather than visitors reduces the sample size for statistical analysis to only eight, and therefore makes statistical significance more difficult to obtain, it provides a more accurate statistical assessment of the impact of interventions. Therefore, mean responses for each of the eight days were first calculated from the responses of individual visitors on each day. Since our mean responses for the eight days are calculated from many visitors they are more accurate than using just eight visitors and hence retain statistical power. Formally, the factorial design is analyzed using the multiple regression equation given by

\[ Y = \beta_0 + \beta_1(\text{toilets}) + \beta_2(\text{ranger}) + \beta_3(\text{interact}) \]

where toilets takes the value of 0.5 for days where the toilets were enhanced and −0.5 when they were not; ranger takes the value of 0.5 for days where the ranger was present and −0.5 when the ranger was absent; and interact takes the value of 0.5 when either both or none of the enhancements (toilets, ranger) are provided and −0.5 when exactly one enhancement is provided. The dependent variable \( Y \) takes 8 values equal to the mean response on each of
### TABLE 1  Hypothesised Relationships Experimentally Tested in This Study

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>H1</strong>: The presence of rangers and enhanced toilets interventions will have no impact on the importance of the attributes to visitors.</td>
<td>No relationship is expected between the interventions and importance of attributes given the interventions are designed to improve performance not importance (H1).</td>
</tr>
<tr>
<td><strong>H2</strong>: The enhanced toilets intervention will increase performance on the attribute “Clean, well presented toilet facilities”.</td>
<td>Each intervention, as detailed in H2–H4, may increase attribute performance depending on the relationship between the intervention and the attribute.</td>
</tr>
<tr>
<td><strong>H3</strong>: The presence of rangers intervention will increase performance on the attribute “Access to friendly, helpful rangers”.</td>
<td></td>
</tr>
<tr>
<td><strong>H4</strong>: The presence of rangers intervention will increase performance on the attribute “Presence of rangers”.</td>
<td>Since the interventions are intended to increase overall satisfaction and loyalty, the effect of the interventions on these responses are tested for each satisfaction and loyalty question (H5–H8).</td>
</tr>
<tr>
<td><strong>H5</strong>: The presence of rangers intervention will increase the overall satisfaction of visitors.</td>
<td></td>
</tr>
<tr>
<td><strong>H6</strong>: The enhanced toilets intervention will increase the overall satisfaction of visitors.</td>
<td></td>
</tr>
<tr>
<td><strong>H7</strong>: The presence of rangers intervention will increase the loyalty of visitors.</td>
<td></td>
</tr>
<tr>
<td><strong>H8</strong>: The enhanced toilets intervention will increase the loyalty of visitors.</td>
<td></td>
</tr>
</tbody>
</table>

The 8 days, and the analysis is repeated for each attribute importance, attribute performance, satisfaction and loyalty question.

This parameterization of the independent variables (using sum-to-zero constraints) simplifies interpretation of regression coefficients: $\beta_1$ is the difference in mean response when the toilets are enhanced compared to when they are not (toilet effect); $\beta_2$ is the difference in mean response when the ranger is present compared to not present (ranger effect); and $\beta_3$ is the difference in the effect of the ranger depending on whether toilets are enhanced or not. When the interaction effects is significant ($\beta_3 \neq 0$), the average ranger effect of $\beta_2$ is lower by $\beta_3/2$ when the toilets are not enhanced and higher by $\beta_3/2$ when the toilets are enhanced. The interaction effect is not hypothesized to exist, and in this case the effect of each treatment (toilets and ranger) does not depend on the level of the other treatment, simplifying interpretation. For example, in the absence of any interaction effect, $\beta_3$ is not only the average effect of the ranger being present but the effect of the ranger when the toilets are enhanced and the effect of the ranger when the toilets are not enhanced.
### TABLE 2 Mean Demographics for the Four Treatment Groups

<table>
<thead>
<tr>
<th>Demographic (values range)</th>
<th>none</th>
<th>toilets</th>
<th>ranger</th>
<th>both</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of visits to park (1–5)</td>
<td>2.60</td>
<td>2.67</td>
<td>3.25</td>
<td>2.56</td>
<td>0.659</td>
</tr>
<tr>
<td>Intended time in park (1–3)</td>
<td>1.91</td>
<td>1.83</td>
<td>2.01</td>
<td>1.99</td>
<td>0.113</td>
</tr>
<tr>
<td>Age of visitor (1–6)</td>
<td>3.12</td>
<td>3.09</td>
<td>3.31</td>
<td>3.11</td>
<td>0.937</td>
</tr>
<tr>
<td>Number of adults (1–10)</td>
<td>4.02</td>
<td>3.30</td>
<td>4.80</td>
<td>4.60</td>
<td>0.089</td>
</tr>
<tr>
<td>Children present (1–2)</td>
<td>1.50</td>
<td>1.50</td>
<td>1.86</td>
<td>1.62</td>
<td>0.056</td>
</tr>
<tr>
<td>WA resident (1–2)</td>
<td>1.78</td>
<td>1.78</td>
<td>1.94</td>
<td>1.83</td>
<td>0.539</td>
</tr>
<tr>
<td>International resident (1–2)</td>
<td>1.14</td>
<td>1.19</td>
<td>1.05</td>
<td>1.15</td>
<td>0.535</td>
</tr>
</tbody>
</table>

See the Questionnaire Content section for definitions of the values of demographics. *p*-values test for differences between the four means.

### Results

**Responses, Visitor, and Visit Characteristics**

Approximately 94% of visitors approached agreed to complete the survey resulting in a total of 358 surveys, ranging from 26 to 73 per day. For each treatment combination, mean values for each demographic variable (and the range of possible values, as defined in the Questionnaire Content section) are provided in Table 2, together with a *p*-value testing the null hypothesis that the means differ by treatment group. While mean demographics do not differ significantly (*p* > .05), visitors were more likely to be visiting with children on the days when the ranger was present but the toilets were not enhanced. Due to the random allocation of treatments to days, this and any other relationship with interventions is due to random chance. Note that few visitors reside outside Western Australia (WA), visitors often had several adults and children in their group and had visited the park previously. This reflects the peri-urban nature of this park.

### Effects of Interventions

The impact of the interventions on the importance visitors place on the attributes was generally small and statistically nonsignificant, thus showing support for *H1* (Table 3). The major exception was the attribute “Other visitors well behaved,” with statistically significant effects of ranger (*p* = .014) and interaction (*p* = .002) (Table 2). The four means (Table 3, left side) indicate importance of this attribute is highest when the ranger is present (6.24) and lowest with no intervention (5.76). It suggests that the presence of rangers increased the importance of other visitors being well behaved in the minds of the surveyed visitors.

The interaction effect reflects the fact that the mean importance is higher for the enhanced toilets versus normal ones (6.07 versus 5.76) when rangers are not present but lower (5.65 versus 6.24) when rangers are present. This effect is unexpected and difficult to explain. Ranger presence also significantly (*p* = .044) increased the importance of “Presence of rangers” by 0.67 (±0.64).

In contrast to importance, the performance of attributes varied significantly with treatment (Table 4). A general trend is a lower mean attribute performance for the control treatment when toilets were not enhanced and rangers were not present. Furthermore, the intervention of rangers present had a more significant impact on the performance of all attributes than the enhancement of toilets. Key findings relevant to hypotheses *H2*, *H3*, and *H4* follow (Table 1).
### TABLE 3 Effects of Treatments on Attribute Importance

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Means</th>
<th>Effects (p-values)</th>
<th>Margin of error</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>none</td>
<td>toilets</td>
<td>ranger</td>
</tr>
<tr>
<td>Able to enjoy nature in this park</td>
<td>6.02</td>
<td>6.10</td>
<td>6.09</td>
</tr>
<tr>
<td>Access to friendly, helpful rangers</td>
<td>4.50</td>
<td>4.65</td>
<td>5.10</td>
</tr>
<tr>
<td>Clean, well maintained facilities</td>
<td>5.84</td>
<td>6.21</td>
<td>6.39</td>
</tr>
<tr>
<td>Presence of rangers</td>
<td>4.28</td>
<td>4.41</td>
<td>5.25</td>
</tr>
<tr>
<td>Useful visitor guides and maps</td>
<td>5.47</td>
<td>5.71</td>
<td>5.61</td>
</tr>
<tr>
<td>Clean, well presented toilet facilities</td>
<td>5.84</td>
<td>6.22</td>
<td>6.38</td>
</tr>
<tr>
<td>Useful information about nature</td>
<td>5.24</td>
<td>5.61</td>
<td>5.61</td>
</tr>
<tr>
<td>Value for money</td>
<td>5.71</td>
<td>5.74</td>
<td>5.86</td>
</tr>
<tr>
<td>Other visitors well-behaved</td>
<td>5.76</td>
<td>6.07</td>
<td>6.24</td>
</tr>
</tbody>
</table>

Mean visitor importance on a seven-point scale for the four treatments, estimated effects (p-values) and margin of error of the effects. Statistically significant (p < .05) effects in bold.
## TABLE 4 Effects of Treatments on Attribute Performance

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Means</th>
<th>Effects (p-values)</th>
<th>Margin of error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Able to enjoy nature in this park</td>
<td>5.84</td>
<td>1.12 (.058)</td>
<td>0.13</td>
</tr>
<tr>
<td>Access to friendly, helpful rangers</td>
<td>4.68</td>
<td>0.36 (.109)</td>
<td>0.48</td>
</tr>
<tr>
<td>Clean, well maintained facilities</td>
<td>5.33</td>
<td>0.29 (.069)</td>
<td>0.33</td>
</tr>
<tr>
<td>Presence of rangers</td>
<td>4.37</td>
<td>0.36 (.037)</td>
<td>0.32</td>
</tr>
<tr>
<td>Useful visitor guides and maps</td>
<td>5.40</td>
<td>0.18 (.172)</td>
<td>0.30</td>
</tr>
<tr>
<td>Clean, well presented toilet facilities</td>
<td>5.07</td>
<td>0.38 (.021)</td>
<td>0.29</td>
</tr>
<tr>
<td>Useful information about nature</td>
<td>5.21</td>
<td>0.04 (.719)</td>
<td>0.31</td>
</tr>
<tr>
<td>Value for money</td>
<td>5.64</td>
<td>0.02 (.809)</td>
<td>0.23</td>
</tr>
<tr>
<td>Other visitors well-behaved</td>
<td>5.78</td>
<td>0.06 (.420)</td>
<td>0.18</td>
</tr>
</tbody>
</table>

Mean visitor performance on a seven-point scale for the four treatments, estimated effects (p-values) and margin of error of the effects. Statistically significant (p < .05) effects in bold.
Mean performance on the attribute “Clean, well-presented toilet facilities” was significantly ($p = .021$) increased by 0.38 ($\pm 0.29$), providing support for hypothesis $H_2$. However, performance of this attribute was also significantly changed by the presence of rangers ($p = .011$) and the interaction ($p = .012$). The means for this attribute reveals a mean performance of approximately 6 when toilets were enhanced, rangers were present, or both, and a lower mean of approximately 5 when no intervention was applied. Thus while performance on toilets is improved by interventions, this improvement appears to result from either (or both) of the interventions tested.

The presence of rangers significantly ($p = .001$) increased the performance of the attribute “Presence of rangers” by 1.08 ($\pm 0.32$) on the 7-point Likert scale. This represents a highly significant increase in both a statistical sense and practical sense and demonstrates the effectiveness of the intervention. The presence of rangers had a similar but less extreme effect of 0.76 ($\pm 0.48$) on the attribute “Access to friendly, helpful rangers” ($p = .012$). Thus there is strong evidence in favor of hypotheses $H_3$ and $H_4$.

Both interventions also produced statistically significant effects for other attributes (Table 4). In particular, the presence of rangers significantly ($p < .05$) increased performance on almost all attributes, with $p$-values less than 0.1 for all attributes. Indirect effects of the enhanced toilets intervention were less pronounced, with understandable but nonsignificant effects for “Clean, well-maintained facilities” ($p = .069$) and “Able to enjoy nature in this park” ($p = .058$) but a less expected significant effect on “Presence of rangers” ($p = .037$).

Despite the presence of rangers having a strong improvement in attribute performance, the effect on satisfaction was weaker (Table 5). There is support for $H_5$ since responses to “I am satisfied with my visit to this park” were significantly ($p = .050$) higher by 0.20 ($\pm 0.20$) when rangers were present. Similarly, the effect of rangers on “My choice to visit this park was a wise one” was higher by 0.23 ($\pm 0.23$) but not statistically significant ($p = .053$). The presence of rangers nonsignificantly ($p = .302$) increased responses to “My visit to this park was exactly what I needed” by 0.20 ($\pm 0.46$). In contrast, the impact of enhanced toilets on satisfaction was never significant statistically ($p > .05$), meaning there was no evidence supporting $H_6$ (Table 1).

Improved performance of attributes (Table 4), especially due to the presence of rangers, caused marginal improvement in satisfaction and negligible improvement in loyalty. The enhanced toilets and presence of rangers had statistically nonsignificant effects on responses to all seven loyalty questions (Table 5). Thus there was no evidence to support $H_7$ or $H_8$. Nevertheless, mean responses for all satisfaction and loyalty questions were higher for the presence of rangers treatment compared with the treatment with no interventions. For example, the presence of rangers increased responses to “Donate money to help protect this park or similar protected areas” by 0.23 ($\pm 0.46$), which while statistically nonsignificant ($p = .233$) is of an effect of similar magnitude to the three satisfaction questions, and by 0.34 ($\pm 0.92$) for “Visit this park again.”

### Discussion

The importance of this study rests both on its contribution to progressing methodologies for visitor research in parks and protected areas that can provide robust, useful results for managers and to the testing of theory. Most of the following Discussion is devoted to these tasks. First, however, to give clear context to these methodological and theoretical considerations and associated future research directions, the results from this randomized experiment are briefly juxtaposed against previous findings, mainly those from observational studies.
## TABLE 5 Effects of Treatments on Satisfaction and Loyalty

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Means</th>
<th>Effects (p-values)</th>
<th>Margin of error</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am satisfied with my visit to this park</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>none</td>
<td>toilets</td>
<td>ranger</td>
</tr>
<tr>
<td></td>
<td>6.05</td>
<td>6.12</td>
<td>6.34</td>
</tr>
<tr>
<td>My choice to visit this park was a wise one</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6.02</td>
<td>6.14</td>
<td>6.43</td>
</tr>
<tr>
<td>My visit to this park was exactly what I needed</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5.95</td>
<td>5.95</td>
<td>6.25</td>
</tr>
<tr>
<td>Loyalty</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recommend to friends and relatives that they visit this park</td>
<td>5.94</td>
<td>6.01</td>
<td>6.27</td>
</tr>
<tr>
<td>Donate money to help protect this park or similar protected areas</td>
<td>4.15</td>
<td>4.47</td>
<td>4.79</td>
</tr>
<tr>
<td>Say positive things about this park to other people</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5.99</td>
<td>6.23</td>
<td>6.35</td>
</tr>
<tr>
<td>Volunteer my time to help conserve this park or similar protected areas</td>
<td>2.75</td>
<td>3.16</td>
<td>3.25</td>
</tr>
<tr>
<td>Pay increased park fees to improve park facilities and park management</td>
<td>4.17</td>
<td>4.04</td>
<td>4.31</td>
</tr>
<tr>
<td>Talk to other people about the importance of this park and other protected areas</td>
<td>5.09</td>
<td>4.90</td>
<td>5.12</td>
</tr>
<tr>
<td>Visit this park again</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5.82</td>
<td>6.00</td>
<td>6.86</td>
</tr>
</tbody>
</table>

Mean visitor satisfaction and loyalty on a seven-point scale for the four treatments, estimated effects (p-values) and margin of error of the effects. Statistically significant (p < .05) effects in bold.
Results Relative to Other Studies

Two sets of results from this study provide particularly interesting comparisons with previous research findings. First, both interventions—the presence of rangers and enhancement of the toilets—not only significantly improved the performance of the related attributes such as “The presence of rangers” and “Clean, well-presented toilet facilities,” but each also significantly improved the performance of a number of other attributes (Table 3). This effect was more pronounced for the ranger intervention with almost all performance attributes significantly improved by this intervention. Other studies (e.g., Lee et al., 2004, 2007; Rivera & Croes, 2010; Tian-Cole et al., 2002), where attributes are grouped to make a construct that is then included in a model to explore correlations between a number of constructs such as service quality and overall satisfaction, have not been able to provide such fine-grained analysis.

This improved understanding of the relationships between the attributes is particularly important for managers, as this study suggests that through manipulating just one attribute—the presence of rangers—managers of this park can improve their performance for almost all of their service quality elements. Interestingly, providing rangers in this study improved perceptions concerning the quality of toilets more than enhancing the toilets themselves! This may be because the human interaction provided by the rangers has a stronger psychological impact on visitors in general than physical structural changes to inanimate facilities such as toilets.

Second, manipulating service quality had a relatively small effect on overall satisfaction and loyalty. Previous papers reliant on structural equation modelling (e.g., Lee et al., 2004, 2007; Rivera & Croes, 2010; Tian-Cole et al., 2002) conclude strong relationships, with service quality widely noted as an antecedent of satisfaction and behavioral intentions/loyalty. In contrast, the results obtained in this study through experimental manipulation suggest a causal relationship between one of the service quality items manipulated (rangers) and overall satisfaction, and no relationship between the other manipulated item (toilets) and overall satisfaction. There was no significant relationship between service quality and loyalty. These findings are important because while improvements in service quality may improve visitor perceptions of service quality, it may not improve loyalty in the way anticipated from the literature.

This significant effect for the presence of rangers but nonsignificant effect for enhancing toilets may be explained by their characterization as a “satisfier” and “dissatisfier,” respectively. Satisfiers are attributes that excite or motivate visitors, with improvements in their delivery hypothesized as being able to significantly increase overall visitor satisfaction. The presence of rangers (a satisfier) in this study did significantly increase overall satisfaction. On the other hand, dissatisfiers have been hypothesized as causing dissatisfaction when not adequately maintained, but not greatly improving satisfaction even when improvements are made. Hypothesizing that toilets are dissatisfiers helps explain why improving this attribute had minimal impact on their perceived performance and did not significantly improve overall satisfaction (Baker & Crompton, 2000; Tonge & Moore, 2007). These mixed results, in terms of the variable effect of the two manipulated service quality items on overall satisfaction, especially where one can be described as a satisfier and the other as a dissatisfier, suggests a rich opportunity for future research.

Methodological and Theoretical Implications and Future Research

Relating the study findings back to their theoretical underpinnings reveals important research opportunities. These emerge, in large part, from an interrogation of nonsignificant
relationships (i.e., between service quality and loyalty) rather than those where significance was found. These nonsignificant results can be considered in a number of ways—as an accurate result juxtaposed against the findings of significance from correlational studies; as a need to pay further attention to other antecedents of loyalty (and hence other theoretical perspectives); as an opportunity to more broadly conceptualize loyalty based on the belief that such a broadening might better describe this construct; and limitations in the design of this study. Each is briefly explored below.

In contrast to regression-based analyses of the service quality–loyalty nexus, which have proposed causal relationships between the two, the relationship between the manipulated service items and loyalty was nonsignificant in this study. For example, Lee et al. (2004) in their study of visitors to Umpqua National Forest in Oregon suggest service quality has a ‘direct effect’ on behavioral loyalty. Structural equation modeling reported in the tourism literature “positively relates” destination attributes (i.e., service quality), satisfaction, and visitors’ behavioral intentions (Zabkar et al., 2010) and identifies quality as an “antecedent” of satisfaction with satisfaction having a “positive effect” on loyalty (Wang et al., 2009). Our finding may reflect the reality of insignificance.

An interesting complexity revealed by this experimental study, and not apparently explored in observational and statistical studies influenced by expectation-disconfirmation theory and subsequent interpretations, is the causal relationships between service quality items. This complexity was evidenced in this study by the finding that the presence of rangers significantly increased the perceived performance of all attributes, not only those related to rangers. Future research could benefit from, for example, comparing two management interventions aimed at improving information for visitors: providing rangers and providing information pamphlets. Such an experiment would clarify which intervention has the largest effect on the perceived performance of a park in providing information and also which has the greatest influence on other attributes, overall satisfaction and loyalty. Such an approach could contribute to a richer interpretation to theoretical perspectives on service quality.

Other antecedents of satisfaction and loyalty, derived from theoretical perspectives in addition to expectation-disconfirmation theory and the influences of service quality, have been widely postulated and tested statistically. Other influences investigated using correlational analyses include experiences previsit (Crompton et al., 1991), the destination image and/or infrastructure (Chi, 2012), and perceptions regarding value for money (Rivera & Croes, 2010). Recent research in Kakadu National Park in Australia by Crilley, Weber, and Taplin (2012) showed that the benefits obtained by visitors were a strong predictor of a positive response to the park. The challenge with these variables is determining how to manipulate them so their influences on satisfaction and loyalty can be experimentally tested.

Recent efforts to include place attachment as an influence on loyalty provides a promising lead (Kyle et al., 2004; Lee et al., 2007; Weaver & Lawton, 2011). The challenge again, however, in experimentally investigating the influences of place and its associated constructs, as with other hypothesized antecedents of loyalty, is determining and designing interventions that reflect changes in place attachment. Only once these interventions have been designed can a randomized experiment be implemented manipulating place attachment, thereby allowing the causal influence of this manipulation on loyalty to be measured.

A further research opportunity with a theoretical underpinning is broadening the conceptualization and measurement of loyalty. The testing and refinement of the associated items is an active, evolving research enterprise (Moore et al., 2013; Weaver 2013). Oliver’s (1999) model of loyalty formation has three parts: attitudinal, conative, and behavioral. Lee et al. (2007) subsequently investigated loyalty in a forest setting using these three elements. Future experimental research could broaden the operationalization of loyalty beyond the
The approach taken in this article to fully represent Oliver’s (1999) model and Lee et al.’s (2007) application. Such a broadening may better capture changes in visitor loyalty in response to experimental interventions and show significant results, rather than the insignificant results obtained in this study, in response to such interventions.

The limitations in the design of this study also provide opportunities for further research. Such randomized experiments now need to be extended to encompass other national parks with different services and facilities and different types of visitors. This will allow further experimental investigation of service quality-satisfaction-loyalty casual relationships. The very high satisfaction levels with this park (above 6 on a 7-point scale) without the interventions (Table 5) made it difficult for any management intervention to produce significant effects on satisfaction. Research on venues where satisfaction is lower would be useful not only to determine whether results are similar to those presented in this paper, but also because venues with low satisfaction are precisely where management interventions are more likely to be recommended to cause improvement in satisfaction and loyalty.

In addition to investigating more parks and different types of visitors, increasing the number of replicates (i.e., days) will allow the deployment of more powerful tests able to detect smaller effects of interventions in a statistically significant way. As an illustrative study, the research reported in this article was limited to two replicates (days) for each of the four treatments, a total of eight days. While this was sufficient to produce meaningful statistical results, this restriction may explain why the intervention of having rangers present in the park produced positive but statistically non-significant effects on loyalty (note, however, it was sufficient to demonstrate significant effects on attribute performance). Although expensive to perform, larger randomized experiments over a larger number of days are warranted. Randomized experiments provide the opportunity for researchers to rapidly progress knowledge in this area through complementing the observational studies currently in the literature.

A final design consideration is the possibility that the strength of an intervention is more important than the type. In this study, there was only one “strength” of intervention—the toilets were either enhanced or not, and rangers were either present and talking to visitors or they were absent. In the future, more nuanced experiments might have rangers present but not interacting, present and interacting, and absent so the strength of the ranger effect can be explored and quantified. Also, the enhancements of the toilets in this study may have been too minor to have a detectable effect. Finally, negative interventions such as making the toilets less attractive may highlight whether managers are spending too many resources on some attributes.

**Conclusion**

This study has illustrated the opportunity provided by a randomized experiment to improve the robustness of conclusions regarding causal relationships between service quality and visitor satisfaction and loyalty in national parks. In particular, theoretical underpinnings of why increasing service quality might increase satisfaction and loyalty deserves re-examination as does the observation that increasing one aspect of service quality might be perceived as increasing another aspect of service quality. Such randomized experiments can be used to complement the sophisticated statistical analyses of observational studies that dominate the current literature. These experiments may be more expensive and difficult to perform than observational studies without any intervention, however a diversity of approaches is preferable to a reliance on a single approach. Randomized experiments can provide further evidence of causality between variables and of direct links between
management actions and desired outcomes. They have an important contribution to make to theory testing and building.

This study has also added to theoretical understanding of the “structural relations” (Kyle et al., 2004) among service quality, satisfaction, and loyalty through a detailed interrogation of the nonsignificant relationships between service quality and loyalty. In particular, this interrogation has contributed to a questioning of the findings of significance from previous theorizing and accompanying correlational studies. Other antecedents of satisfaction and loyalty, derived from theoretical perspectives in addition to expectation-disconfirmation theory and the influences of service quality, are suggested as useful avenues to pursue. Growing bodies of research investigating the relationships between benefits and positive response to a park (e.g., Crilley et al., 2012) and between place attachment and loyalty (e.g., Weaver, 2013) provide promising future research directions. Lastly, theoretical insights regarding loyalty suggest a broadening of this construct in future research to further consider Oliver’s (1999) model of loyalty formation with its attitudinal, conative, and behavioral elements.

Absolutely essential to the success of these randomized experiments is having the support for and active involvement of park rangers and managers in the research. Support from senior staff is also essential to acquire permission to change management procedures, such as staff rosters and payments and facility cleaning schedules. Just as critical, if not more so, is having the support of on-ground staff, in this case the rangers, who either need to be present and actively engaging with visitors or out of sight. The former can be a difficult demand to make of field staff who are already overcommitted and time-poor and may be not be amenable to devoting an extended period of time to walking around and chatting with visitors. Design features that can assist in obtaining support and engagement from park staff include: selecting interventions that are important to managers and that previous visitor surveys have shown are important to park visitors; determining the survey dates and times in consultation with park staff; liaising with staff regarding the content of the survey instrument; and promising and providing detailed feedback on the survey results to park staff once the research is completed.

This article opens a new avenue of research that promises to be valuable to both academic researchers and managers. A specific point of focus has been achieving a better theoretical understanding of which attributes achieve improved performance through particular management interventions. Past literature assuming that the intervention best suited to improving an attribute such as toilets is to manipulate the service quality of that attribute rather than another (e.g. rangers in this study) should be challenged and investigated further. Another potential focus might include testing the effect of decreasing as well as increasing service quality with randomized experiments. Managers could also consider brief randomized experiments prior to permanent changes to accurately access their potential effect. In conclusion, randomized experiments are not only able to raise the level of scientific rigor in leisure and tourism research, they also provide robust, useful conclusions for management.

References


Testing the Effect of Management Interventions


