The benefits of using randomised experimentation rather than observational studies for visitor survey social research

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Visitor research reported in the literature includes numerous studies investigating the relationships between constructs such as service quality, satisfaction and loyalty. In particular, managers of recreational venues, including national parks, are interested in whether management interventions to improve facilities and services will cause improved visitor satisfaction and improved loyalty, such as behavioural intentions to visit again or recommend to others. This is important not only because these constructs can be used as key performance indicators to evaluate management performance, but loyalty can generate increased interest in nature conservation, revenue from fees, and political influence.

Although minor variations exist, most of this past literature can be summarized by the logical sequence that increasing service quality leads to increased satisfaction, and increased satisfaction leads to increased loyalty (Figure 1). This research has obvious implications for park managers trying to increase loyalty, especially when research can indicate which aspects of service quality will lead to the greatest increase in loyalty.

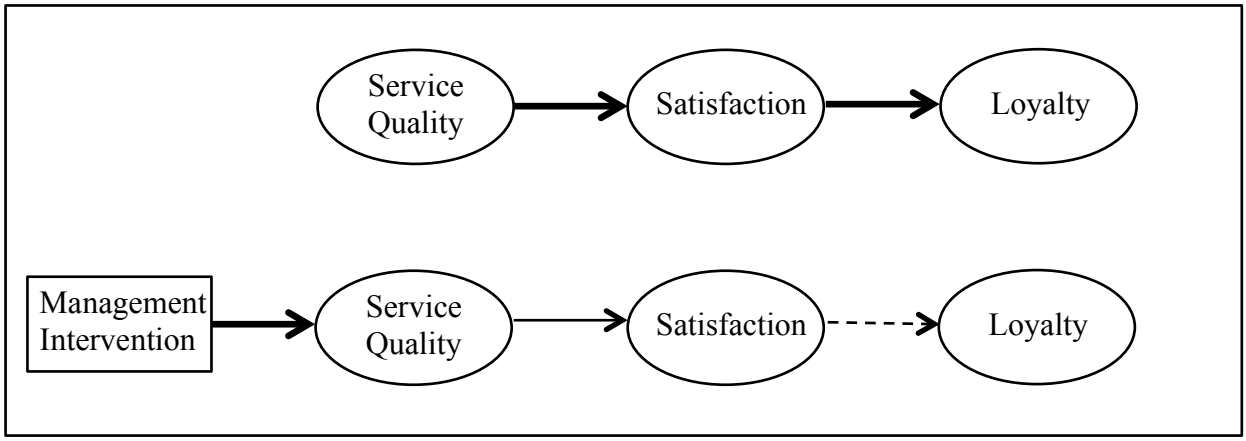

Figure 1. Cause and effects from observational studies in the literature (above) and from randomised experiments (below). Thicker arrows denote stronger evidence of relationships between constructs.

Data investigating relationships between service quality, satisfaction and loyalty is typically derived from visitor surveys, where visitors are asked to respond to Likert scale questions about these aspects. Statistical analysis can include techniques such as multiple regression and structural equation modelling. Most of these studies rely on observational studies to collect the data for these analyses while this paper provides a methodological critique of the benefits of using randomised experiments from statistical science.

Randomised experiments and observational studies

Randomised experiments refer to the situation where treatments are randomised to experimental units by the researcher. The key to analysis is to use this randomisation to inform the statistical analysis of the resulting data by comparing the estimated effect of the treatment from the observed data with the possible effect under different random allocations (assuming the null hypothesis of no treatment effect). Statistical significant results ($p < .05$) could be due to 'unlucky' random assignments (with 5% probability), but typically are taken as evidence against the null hypothesis.

Observational studies refer to the situation where no randomised allocation occurs, and usually no intervention at all, other than observing responses. In visitor studies observational studies are common but randomised experiments are rare, while both are common in mainstream science. In science, observational studies are often used to suggest effects and randomized experiments used as confirmation. Randomised experiments are, however, not always possible since allocation of treatments is not practically possible or is unethical, especially in social science but often in science as well.

Despite general recognition that statistical correlations are not the same as causality, there are differing views over how causality can be inferred. Randomised experiments are generally considered scientifically superior to observational studies in science for determining causality (Ramsey and Shafer, 2002) but the use of structural equation models with observational data has been justified as a means for establishing causality in social science (Bollen and Pearl, 2013).

Using randomised experiments for visitor survey research

Scientific studies using randomised experiments into visitors' experiences in parks are extremely rare. Park et al. (2008) used a randomised experiment to conclude which management practices reduced the number of visitors who walked off trail in Acadia National Park (Maine, USA). Steckenreuter and Wolf (2013) used an experimental approach to test the contribution of persuasive information to visitors' compliance of fee payment in Kamay Botany Bay National Park in New South Wales (Australia). They found significant effects on compliance rates of park user fees from two treatments using messages on signage compared to a control. While both randomized experiments, the former study only investigated the effect on one visitor behaviour while the latter investigated the effect of the intervention on one specific loyalty behaviour (pay fees).

Investigation of relationships between service quality, satisfaction and loyalty using randomised experiments are notably absent from the literature, however those conducted by the authors have produced profound results. Their unpublished randomised experiments have found very strong evidence that some management interventions (i.e. treatments) caused changes in visitors' perceptions of service quality, but much weaker evidence that the interventions caused changes in satisfaction, and almost no evidence that this results in changes in loyalty (Figure 1).

Conclusion

The different result from observations studies and these preliminary randomised experiments have several implications for visitor research. First, assumptions concerning causal effects between service quality, satisfaction and loyalty require further scrutiny. Second, more randomised experiments are required in future research to address past emphases on using observational studies in visitor research. This imbalance juxtaposed against the situation in science suggests randomised experiments have a lot to offer visitor research, especially since it is generally recognized that randomised experiments provided stronger evidence of causal relationships than observational studies. They also more closely mimic what managers want to know: will an intervention improve

satisfaction and loyalty? Third, since randomised experiments are typically more expensive than observational studies, social science research into visitor studies deserves increased funding so the level of scientific evidence can be improved to the level of their scientific counterparts.

References

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