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Contrasting Online and Onsite Sampling Methods: Results of Visitor Responses to a Destination Survey

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ABSTRACT

The spectacular growth and adoption of the Internet has created a myriad of opportunities in the field of marketing. These opportunities include not only promotion and customer relationship management but also market research. Tourism academics have been slow in following tourism operators and consultants in using the Internet as a research tool. This reluctance is partly due to concerns about the reliability and validity of Internet samples. This paper contrasts an onsite sampling method with a self-selected online sample. Both samples responded to the same questions about a popular tourist destination in Australia. The findings indicate significant differences between the onsite and online samples. The online sample had significantly more female respondents. There were also major differences in travel motives, perceptions of destination attributes and information sources used. The online survey appeared to be affected quite substantially by coverage error and non-response bias. This suggests that researchers and tourism operators should be cautious about the temptation to use self-selected online surveys instead of onsite surveys, particularly for destination or location specific studies.

INTRODUCTION

The Internet is increasingly being used as data collection tool by tourism operators and consultants and is slowly gaining credence amongst academic researchers as a viable research tool. Adoption of the internet as a research tool has been cautious in academia, with some editors and reviewers treating internet-based studies with suspicion (Gosling, Vazire, Srivastava and John, 2004). While some research suggests that these suspicions may be well founded, a number of proponents have argued that the Internet has potential as a suitable data collection method for certain sampling frames and types of research. Like all data collection methods, Internet research brings with it an inherent set of advantages and disadvantages.

The tourism literature provides quite a solid, albeit still inadequate, debate about the use of the Internet as a research tool. Interestingly much of the discourse on Internet sampling methods has been limited to the *Journal of Travel Research*. A number of studies provide an evaluation of a variety of online sampling approaches, including email surveys, email solicitation and self-

selected web-based surveys. An early attempt by Schonland and Williams (1996) to evaluate an online travel survey resulted in a useful discussion of strengths and weaknesses, as well as some initial suggestions for overcoming the limitations of this mode. The authors concluded that the web survey format was viable but that there were some concerns about response bias. Tierney (2000), in his Internet-based analysis of tourism website effectiveness concluded that there are substantial methodological challenges in conducting Web-based surveys. Hwang and Fesenmaier (2004), drawing on these concerns and observations in the broader social science literature (cf. Dillman, 2000; Couper, 2000), explore the assertion that the voluntary nature of self-selected Internet surveys makes them vulnerable to coverage errors and non-response bias. The authors use respondents' 'willingness to provide personal information on a travel-related website' as an independent variable to prove that this is indeed the case. However, there is an underlying trust and security dimension to this question. Willingness to provide personal information is not the same as willingness to complete an online survey, particularly if the survey provides a degree of anonymity. Users may be reluctant to leave personal details for fear of being spammed. Despite this limitation, the work of Hwang and Fesenmaier (2004) creates some doubt about the veracity and generalisability of some web-based studies, particularly when generalising the findings of the survey to a population that includes non-web users and/or self-selected non-participants.

An interesting comparison of two methods employing the same survey is provided by Litvin and Kar (2001), who examined differences between the 'mall-intercept' sampling method commonly employed by some tourism researchers and an email survey. This comparison identified differences in demographics (education, income and marital status) but no differences in the psychographics of respondents. Overall the authors concluded that the 'e-survey' provided few significant differences when compared with their mall intercept sample. Cole (2005) adopts a similar approach to compare mail and web-based versions of the same survey administered to travel retailers. This work adds to several studies beyond the tourism literature which have compared web-based or email-based surveys with mail surveys. Respondents in this study were attracted to the web survey using targeted email solicitation. Cole (2005) found that the response rate to the web-based survey was lower than the mail survey and web respondents tended to be significantly younger. When exploring data quality, it was found that the web-based survey had more missing data fields than the mail survey. Cole also explored the internal consistency of scale items and found that mean scores were consistently lower for web respondents.

Litvin and Kar (2001, p.313) note that "with rapid change of the underlying technologies, it is possible that the research community will find it difficult to reach a consensus regarding the use of e-survey techniques." Access to the Internet continues to grow, narrowing the gap between online users and the general population. The authors encourage further research in new locations and contexts and suggest that researchers should incorporate e-surveying as a supplement to their primary data collection method to allow for a comparison of traditionally gathered sample data and 'e-samples'. The research addresses this 'call to action' by comparing the results of an onsite destination survey with a supplementary online survey. Several researchers have compared email and web-based samples with mail samples and telephone samples. In the case of Litvin and Kar (2001) email samples were compared with onsite samples. This research seeks to fill a gap by comparing a self-selected online sample with an onsite sample. Given that on-site surveys are widely used in the tourism industry by both academics and operators, it is useful to explore whether these two sampling approaches yield comparable results. The research is guided by the following research questions

- Does the online sample exhibit the same demographic profile as the onsite sample?
- Does the online sample exhibit the same psychographic profile as the onsite sample?
- Does the online sample exhibit similar attitudes toward destination attributes as the onsite sample?
- Does the online sample provide the same data quality as the onsite sample?
- If differences in responses do exist, do such differences produce different research outcomes following further analysis?

METHOD

To facilitate the comparison between the online survey and the onsite survey two separate data collection exercises were conducted in Australia. The focus of the survey was to explore the destination image and branding of the Whitsundays region in North Queensland, Australia, however the topic of the survey is incidental to the focus of this paper. The onsite survey was conducted over a period of several days at key tourist sites in the Whitsundays region. Researchers were employed to distribute a six page self-administered questionnaire to visitors in the region. The onsite sample consisted of 372 valid surveys. The online survey was hosted by an online market research organisation. Visitors were attracted to the online survey by a small (3.0cm x 1.5cm) animated button on the official consumer homepage of Tourism Whitsundays, the regional tourism organisation. Only consumers seeking information about the Whitsundays region by visiting the official tourist website were exposed to the survey announcement. The button offered visitors a chance to win one night of accommodation at a prominent Whitsunday resort in return for completing the questionnaire. The online questionnaire was organised with questions displayed across nine pages with a progress indicator on each page. Respondents were not required to complete all of the questions on a page before progressing to the next page. The online survey was available for six months and yielded 204 surveys, of which 158 valid surveys were retained for further analysis. The two surveys contained identical questions, however a few questions were omitted from the online survey because they were not necessary for comparative purposes. The questionnaire included questions gathering demographic information, travel behaviour (including travel party, and previous experience in the region), psychographic information (travel motives, self congruence), destination attributes and information search preferences.

RESULTS AND DISCUSSION

The results are organised according to the research questions presented earlier in the paper. The first research question was concerned with whether the online sample exhibits the same socio-demographic profile as the onsite sample. *Table 1* provides a comparison of the demographic characteristics for online and onsite respondents. Statistical analysis has been conducted using non-parametric statistics to account for the differences in online and onsite sample size and the distribution of the data.

The results indicate that significantly more females completed the online survey. Males are better represented in the onsite sample because researchers were instructed to maintain a relatively even balance between males and females. When exploring origin, it was found that the

online and onsite samples exhibited similar proportions of domestic and overseas visitors. However, when exploring origin in more detail, it was found that the online domestic sample contained significantly more interstate respondents. While the number of overseas visitors in both samples was low, differences in country of origin were also observed between the two sampling methods. For example, the onsite sample contained no Canadians, while 22% of overseas respondents in the online sample were Canadian. The online sample also contained higher proportions of New Zealanders and respondents from the USA. Significant differences were also found in travel party composition, with the online sample being more likely to travel with a spouse or partner with no children. No significant difference was found in the proportion of repeat visitors across the two samples. However, the mean number of visits for online respondents who had visited the region previously was 2.5 visits. This was significantly lower than the mean number of visits for the onsite sample (4.1 visits).

Table 1. Socio-demographic profiles of online and onsite respondents

Variables	Online	Onsite	Test
<i>Gender (%)</i>			
Male	14.9	46.9	$\chi^2 = 46.91^*$
Female	85.1	53.1	
<i>Origin (%)</i>			
Domestic	82.6	81.8	$\chi^2 = 40.04$
International	17.4	18.2	
<i>Domestic State of Origin (%)</i>			
New South Wales & ACT	39.2	24.3	$\chi^2 = 411.38^*$
Victoria	20.8	28.7	
Queensland	32.8	42.1	
South Australia	1.6	1.6	
Western Australia	3.2	1.6	
Tasmania	2.4	1.6	
<i>Travel Party Composition (%)</i>			
Visiting alone	7.1	12.3	$\chi^2 = 416.30^*$
With partner	54.8	38.4	
With family	22.6	28.9	
With group of friends	13.5	14.0	
With organised tour or group	-	2.9	
Another type of group	1.9	3.4	
<i>Repeat Visitation</i>			
Repeat visitors (%)	46.1	46.2	$\chi^2 = 40.00$ $U = 3790.0^*$
Number of repeat visits (mean)	2.5	4.1	

* Significant at the $p < 0.05$ level.

When information search behaviour was investigated it was found that the online sample differed significantly from the onsite sample in their use of the Internet, family and friends, brochures obtained outside the region, other travellers, books and tour operators (see Table 2). The Internet was the most common information source for both online and onsite travellers and this is an important finding given the focus of this paper. However, online survey respondents were significantly more likely to use the Internet, as well as printed sources such as brochures (outside the region) and books. Surprisingly the use of travel agents did not vary much between the online and onsite samples. Online respondents were significantly less likely to use personal sources of information such as friends, family or other travellers.

Table 2. Information sources used by online and onsite respondents

Information Sources	Online (%)	Onsite (%)	Chi-square
The Internet	87.2	62.7	30.51*
Travel agent	44.2	45.0	0.02
Friends/family members	37.8	47.4	4.01*
Brochures picked up outside the region	35.9	17.4	21.06*
Articles in newspapers/magazines	28.2	30.5	0.27
Other travellers	21.8	30.0	3.63*
Books/library	15.4	8.7	5.09*
Been before	10.9	16.6	2.81
Accommodation	10.3	9.5	0.07
Brochures picked up inside the region	9.6	9.3	0.02
Booking/information centres in the region	7.7	7.1	0.06
Tour operator/company	3.2	9.3	5.81*
Automobile association	1.9	4.9	2.52

* Significant at the $p < 0.05$ level.

The second research question was whether the online sample exhibited the same psychographic profile as the onsite sample. The key psychographic characteristics used in this research were travel motives and self-congruity with the destination. Travel motives were measured by asking respondents to rate the importance of fifteen benefits when making a holiday decision on a five point scale ranging from 1=not at all important to 5=very important. The results of non-parametric means testing shown in Table 3 revealed that the online and onsite samples differed significantly on all but three of these items. Interestingly, the online sample produced consistently higher mean ratings for all scale items.

Table 3. Mean^a level of importance of travel motives for online and onsite respondents

Travel Motives	Online	Onsite	Mann-Whitney <i>U</i>
To meet local people	3.15	2.48	17704.0*
To have a break from work and daily routine	4.73	4.67	25568.5
To learn about/experience another place	4.43	4.10	20294.5*
To meet other travellers	3.18	2.88	22003.5*
To enjoy and learn about wildlife and nature	3.99	3.41	18423.0*
To spend time with close friends and relatives	4.23	3.89	20821.5*
To feel more independent	3.55	3.23	21505.5*
To grow as a person	3.86	3.20	18436.0*
To challenge myself	3.82	3.27	18610.0*
Because others have recommended it	3.32	3.17	23689.0
To do and experience things I can't do at home	4.56	4.19	19722.0*
Because others will be impressed by my travelling there	2.49	2.23	22325.5*
To have some excitement	4.34	3.90	19159.5*
To rest and relax	4.74	4.54	22446.5*
To be physically active	3.94	3.77	24215.0

* Significant at the $p < 0.05$ level.

^a Mean based on 1 = not at all important...5 = very important.

Self congruence was measured using the four item Likert scales developed by Sirgy and Su (2000). Visitors were asked whether a Whitsundays holiday was consistent with how they see themselves, how they believe others see them, how they would *like* to see themselves and how they would *like* others to see them. The first two items measured perceived self-congruity with the

destination, while the last two items measured ideal self-congruity. The results shown in Table 4 indicate that the samples did not differ greatly in terms of perceived self-congruity, but there were significant differences between the samples when measuring ideal self-congruity. The online sample was much more likely to agree with the two statements measuring ideal congruity.

Table 4. Self-congruence measures for online and onsite respondents

A visit to the Whitsunday's is...	Online	Onsite	Mann-Whitney <i>U</i>
consistent with how I see myself	2.27	2.21	21759.0
consistent with how others see me	2.77	2.85	18554.5
consistent with how I would like to see myself	1.76	2.29	15032.5*
consistent with how I would like others to see me	2.18	2.60	15146.0*

* Significant at the $p < 0.05$ level.

^a Mean based on 1 = strongly agree...5 = strongly disagree.

The third research question queried whether the online sample exhibited similar perceptions of destination attributes as the onsite sample. Destination attributes were measured by asking respondents to rate their level of agreement with 18 statements using a five-point Likert scale. Table 5 shows that the two samples differed significantly on all but three of the items. Online respondents showed stronger agreement with 16 of the 18 statements.

Table 5. Perceptions of destination attributes for online and onsite respondents

The Whitsunday's is a place...	Online	Onsite	Mann-Whitney <i>U</i>
that is safe to visit	1.65	1.51	25629.5
that is easy to get to	2.26	1.96	23211.5*
that provides value for money	2.54	2.76	22630.5*
where I can meet local people	2.64	3.00	19854.0*
where I can have a break from work and daily routine	1.36	1.40	25463.0*
that is interesting to learn about/experience	1.68	1.93	22802.0*
where I can meet other travellers	1.88	2.06	23603.5*
where I can enjoy and learn about wildlife and nature	1.84	2.26	19847.5*
where I can spend time with close friends and relatives	1.88	1.96	25340.5
where I can feel more independent	2.16	2.41	23611.5*
where I can grow as a person	2.14	2.71	18739.5*
where I can challenge myself	2.13	2.52	21168.5*
that other people have recommended to me	1.97	2.21	22211.5*
where I can experience things I can't do at home	1.52	1.71	23446.5*
that will impress others when I tell them I was there	1.97	2.31	22038.0*
that is exciting	1.59	1.96	20409.0*
where I can relax	1.32	1.41	24004.0*
where I can be physically active	1.76	1.81	26059.0

* Significant at the $p < 0.05$ level.

^a Mean based on 1 = strongly agree...5 = strongly disagree.

The fourth research question was concerned with data quality. Data quality in this instance was measured using two approaches. Each sample was subjected to a missing value analysis. Included in this was an analysis of respondents who indicated 'not sure' or 'N/A' on some of the scale items. This was followed by analysis of the internal reliability of scale items. The missing value analysis revealed that the onsite sample contained a higher proportion of incomplete or missing values on most of the items that were analysed. The self-congruity scales and destination

attribute scales discussed above allowed respondents the option of selecting ‘not sure’ or ‘N/A’. An analysis of these items revealed mixed results. Significantly more respondents in the onsite sample selected ‘not sure’ when answering the self-congruity questions. However, when examining destination attributes 17 of the 18 items showed no significant difference in respondents selecting ‘N/A’. The internal reliability of the travel motivation scales, the self congruity scales and the destination attributes scales were calculated using Chronbach’s Alpha. This analysis yielded similarly high levels of internal consistency for both samples, indicating very little differences in internal reliability.

Finally, of particular interest to practitioners and academics is the question of whether some of the differences observed produce different research outcomes when subjected to further analysis. To test this question, the travel motivation scales and destination attribute scales were subjected to principal component factor analyses with varimax rotation. The results of these factor analyses are presented in Tables 6 to 9.

Table 6. Factor analysis of motives for online respondents

Travel Motives	Factor 1	Factor 2	Factor 3	Factor 4
to have a break from work and daily routine	0.87			
to rest and relax	0.86			
to do and experience things I can't do at home	0.68			
to learn about/experience another place	0.65			
to have some excitement	0.61			
to spend time with close friends and relatives	0.45			
to challenge myself		0.88		
to grow as a person		0.87		
to feel more independent		0.78		
to be physically active		0.62		
to meet other travellers			0.81	
to meet local people			0.81	
to enjoy and learn about wildlife and nature			0.56	
because others have recommended it				0.78
because others will be impressed by my travelling there				0.76
Rotated Eigen Values	3.15	3.03	1.92	1.61
% of Variance	21.00	20.21	12.80	10.73

Table 7. Factor analysis of motives for onsite respondents

Travel Motives	Factor 1	Factor 2	Factor 3	Factor 4
to rest and relax	0.83			
to have a break from work and daily routine	0.82			
to learn about/experience another place	0.66			
to do and experience things I can't do at home	0.65			
to have some excitement	0.52			
to be physically active	0.49			
to grow as a person		0.84		
to feel more independent		0.81		
to challenge myself		0.78		
to enjoy and learn about wildlife and nature		0.48		
to meet local people			0.80	
to meet other travellers			0.80	
to spend time with close friends and relatives			-0.41	

Travel Motives	Factor 1	Factor 2	Factor 3	Factor 4
because others will be impressed by my travelling there				0.76
because others have recommended it				0.73
Rotated Eigen Values	3.03	2.81	1.81	1.59
% of Variance	20.19	18.70	12.04	10.58

The travel motivation scale produced four factors for both the online and onsite samples. The four factors were largely consistent between the two samples, however three of the 15 items loaded on different factors. Spending time with close friends and relatives, being physically active and enjoying and learning about wildlife loaded on different factors in the two solutions. While there were some differences between the two samples in terms of the average ratings of motives presented in Table 3 this did not produce a substantially different factor analysis. It seems that the average ratings of respondents for the online survey are simply higher but the relationship between the variables is similar to that exhibited by the onsite sample.

Table 8. Factor analysis of perceived destination attributes for online respondents

The Whitsunday's is a place...	Factor 1	Factor 2	Factor 3	Factor 4
that is exciting	0.79			
where I can relax	0.77			
where I can experience things I can't do at home	0.75			
where I can be physically active	0.75			
that is interesting to learn about/experience	0.71			
that will impress others when I tell them I was there	0.63			
where I can enjoy and learn about wildlife and nature	0.62			
where I can meet other travellers	0.56			
where I can grow as a person		0.84		
where I can challenge myself		0.78		
where I can feel more independent		0.75		
where I can meet local people			0.83	
that provides value for money			0.78	
that is easy to get to			0.71	
where I can spend time with close friends and relatives				0.81
where I can have a break from work and daily routine				0.67
that other people have recommended to me				0.57
that is safe to visit				0.48
Rotated Eigen Values	4.90	2.73	2.68	2.62
% of Variance	27.23	15.14	14.86	14.57

Table 9. Factor analysis of perceived destination attributes for onsite respondents

The Whitsunday's is a place...	Factor 1	Factor 2	Factor 3	Factor 4
where I can enjoy and learn about wildlife and nature	0.74			
that is interesting to learn about/experience	0.69			
where I can be physically active	0.68			
where I can challenge myself	0.63			
where I can grow as a person	0.63			
where I can meet local people	0.55			
where I can spend time with close friends and relatives	0.48			
where I can meet other travellers	0.48			
that will impress others when I tell them I was there		0.73		
that other people have recommended to me		0.69		

The Whitsunday's is a place...	Factor 1	Factor 2	Factor 3	Factor 4
where I can feel more independent		0.59		
where I can experience things I can't do at home		0.57		
that is exciting		0.52		
where I can have a break from work and daily routine			0.80	
where I can relax			0.78	
that is safe to visit			0.64	
that provides value for money				0.69
that is easy to get to				0.68
Rotated Eigen Values	3.57	2.89	2.61	1.53
% of Variance	19.81	16.05	14.52	8.51

The factor analyses of the destination attributes scale also produced two four factor solutions for each sample but there was almost no similarity between the two solutions, with only four of the 18 items loading conclusively on the same factors.

CONCLUSION AND IMPLICATIONS

Overall the onsite and online sampling methods exhibited a number of statistically significant differences in responses. There were notable differences in the information sources used by the two different samples. While there were also differences in the motives of respondents the mean ratings followed the same internal pattern but were exaggerated for the online sample. There were substantial differences in perceptions of destination attributes. The onsite survey gathered data from actual visitors, while the online survey was targeted at prospective visitors and this may impact on respondents' perceptions of the destination. However, as reported earlier the extent of repeat visitation for the two samples was almost exactly the same, indicating that substantial numbers of respondents from both samples had visited the destination before. An element of bias may be introduced by the lower level of destination experience for the online sample. This may be due to the fact that the onsite sample were more likely to come from intrastate, while the online sample had a greater representation of visitors from other states. Seasonality may be an underlying variable in the research since it is possible that the timing of the onsite survey may not have coincided with heavy visitation from interstate visitors. However, the level of familiarity or experience with the destination is an important variable in some studies and if an online method cannot measure this accurately then self-selected samples may be inappropriate for destination-based research.

The study does have some limitations. In particular, intervening variables might account for some of the differences observed. The lower sample size of the online sample may also have influenced some of the results. While an attempt was made to obtain a more representative sample in the onsite survey, the online survey appears to be affected quite substantially by coverage error and non-response bias. Of particular concern is the high number of female respondents in the online sample. It would be useful to explore whether there is a consistent response set amongst respondents to online travel surveys. Earlier studies reported a bias toward males, but the Internet has matured and evolved from being dominated by a techno-centric male audience to a gender split which is more equitable. More contemporary work is needed to determine whether the gender split for self-selected internet surveys now favours female respondents. Several recent studies appear to indicate a higher number of female respondents to online surveys (Kim, Lehto and Morrison, 2007; Kim, Kim and Han, 2007). If this is a consistent trend then researchers can begin to model for this sampling error. If however, socio-demographic

attributes such as age and gender vary from one self-selected response set to another then there is a considerable opportunity for research investigating how or why particular respondents self-select for certain types of online surveys. Hwang and Fesenmaier (2004) observe that respondents who like to visit new destinations, enjoy the travel-planning process, and participate in outdoor activity environments appear more likely to be overrepresented in self-selected online samples. A close examination of the patterns of response to the motivation and destination attribute scales certainly appears to suggest this is the case. Some researchers have found that female travellers are more detailed and exhaustive in their information search strategies. Furthermore, females reportedly consult a wider variety of both online and offline information sources while choosing travel destinations (Kim et al., 2007). If this is the case it is possible that more female travellers may have chanced upon the Whitsundays destination website containing the link to the survey.

Overall, the findings suggest that researchers and tourism operators should be cautious about the temptation to use self-selected online surveys instead of onsite surveys, particularly for destination or location specific studies. Self-selected online surveys may be more accurate and appropriate when the sampling frame consists of users who are acquainted with the Internet and use it to plan and purchase travel experiences. In this case there is likely to be a good match between the sampling frame and the response set. However, most visitor focussed studies in tourism are concerned with a much broader sampling frame which appears difficult to capture using a self selected online sampling approach.

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