The impact of offering choice in response mode: A comparison of post, telephone and Internet respondents in a multi-mode longitudinal travel survey

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Abstract

Recruitment and response rates to both academic and market research surveys have been progressively declining over time. In an attempt to counteract such declines, multi-mode surveys are increasingly being used to provide respondents with the option to choose the lowest burden response method. This paper reports on an on-going longitudinal panel survey of vehicle usage in 200 households in Adelaide and Melbourne, which is designed to measure the nature of any changes in the quantity of vehicle kilometres travelled (VKT) within households and in which households are offered a choice of using the post, the telephone or the Internet to report their odometer readings. While this survey has not been designed as an experiment for the purpose of comparing response modes, the preliminary findings presented here provide some curious insights into response characteristics.

Key words: Survey, Response Rate, Response Mode, Panel

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1 Introduction

Recruitment and response rates to both academic and market research surveys have been progressively declining over time (Dillman, 2002). In an attempt to counteract such declines, multi-mode surveys are increasingly being used to provide respondents with the option to choose the lowest burden response method (Tourangeau, 2004). Travel surveys are particularly demanding of respondents, and reducing respondent burden is a priority in transport research (Bonnel, 2003).

The Institute of Transport and Logistics Studies is conducting an on-going longitudinal panel survey of vehicle usage in 200 households in Adelaide and Melbourne. The purpose of the study is to measure the nature of any changes in the quantity of vehicle kilometres travelled (VKT) within households. The survey requires households to report the odometer readings of every household vehicle and demographic information at three month intervals. Households are offered a choice of using the post, the telephone or the Internet to report their odometer readings. At present, four waves of data collection have been conducted.

While this survey has not been designed as an experiment for the purpose of comparing response modes, the preliminary findings presented here provide some curious insights into response characteristics. This paper analyses the differential rate of uptake to the three different response modes and explores the demographic characteristics of the sample by response modes and across the life of the survey. Furthermore, it explores the drop-out rate by response mode and the impact of postcard and telephone reminders used to ensure 200 households return data. These comparisons are presented for each of the Adelaide and Melbourne samples to explore the character of regional difference.

2 Background

2.1 The travel survey context

Travel surveys are conducted regularly and on a large scale in much of the world to facilitate transport modelling, forecasting and planning. Traditionally, pen and paper travel diaries have been the dominant method for collecting travel data with extensive use of face-to-face interviewing, Computer Assisted Telephone Interviewing (CATI), and in recent years, Computer Assisted Personal Interviewing (CAPI) and Computer Assisted Self Interviewing (CASI). There is great attention within the field to survey methodology and ways of minimising error (e.g. Stopher and Jones, 2003).

Following Groves (1987) there are, broadly speaking, four types of survey error:

- Coverage error relating to the exclusion of population subsets by sample frame design;
- Sampling error relating to the quality of the sample statistics;
- Non-response error relating to the differential rate of refusals or non-compliance in different sections of the population; and
- Measurement error relating to the difference between the measured characteristic and the true value of the characteristic.

One of the primary reasons for employing mixed modes has been as an attempt to minimise coverage error – by recruiting via different methods to reach different sections of the population – and non-response error – by providing different types of persons or households with a choice of response modes that are personally least burdensome (e.g. Ampt and Stopher, 2005).

The survey described in this paper employed a single recruitment method with a choice of response mode to mitigate against non-response error and bias. As a result, the characteristics that this paper will focuses on are related specifically to indicators of non-response error rather than coverage, sampling or measurement errors.

Kalfs and Van Evert (2003) describe some of the characteristics of persons typically underrepresented in travel surveys in household travel surveys. These characteristics include:

- Very high and very low income persons;
- Very high and very low level travellers;
- Young single persons; and
- Older and younger persons.

In contrast, Ampt and Stopher (2005) report that in the Sydney Household Travel Survey nonrespondents were likely to be in the 15-49 years age bracket. Along with researchers from many other fields, multi-mode surveys have started to be employed in an effort to reduce sampling error, reduce respondent burden and improve response (Morris and Adler, 2003).

2.2 The research context

The survey described in this paper is designed to evaluate the impact of a Voluntary Travel Behaviour Change (VTBC) Program. VTBCP is a term used to cover a variety of travel demand management approaches which "seek to find the means for individuals and households to change their travel behaviour – adopting approaches where individuals choose their own method of changing travel behaviour rather than simply acting in response to external policies or pressures" (Taylor and Ampt, 2003, p165). That is, the public is provided with tools to equip them to change their travel behaviour voluntarily. There have been many such programs conducted in Australia under the brand TravelSmart® (Red3, 2005).

Australian State governments have been implementing TravelSmart for some time and a group of agencies have come together as the National Travel Behaviour Change Program. This consortium has funded the present study as a pilot to test survey instruments and methodological approach for a large-scale national evaluation of TravelSmart implementations over a period of five years starting in 2008. the odometer survey described in this paper has been simultaneously conducted in the western suburbs of Adelaide – in the Local Government Areas of Charles Sturt, Port Adelaide and Holdfast Bay – and in the inner Northern Melbourne locality of Darebin. These areas were chosen because they were being approached by TravelSmart implementation (Darebin).

This survey's primary aim is to quantify the change in the total number of vehicle kilometres travelled (VKT) by household in the wake of the roll-out of a VTBC Program to measure the sustainability of the program's outcomes. Evaluation of VTBCP initiatives has consistently been identified as somewhat problematic (Ker, 2002; Taylor and Ampt, 2003; Ampt, 2001). The challenge for evaluators is to identify the occurrence of travel behaviour change, quantify it and describe its character. Odometer surveys conducted with a longitudinal panel have been recommended (Stopher et al. 2005) as a potentially valuable tool for fulfilling at least part of these requirements. They offer the opportunity to measure the trends in car use among households participating in VTBC initiatives, compared to a control of those not participating.

This paper is not concerned with describing the outcomes of the survey in measuring VKT, but rather it aims to describe the success (or not) of the multi-mode longitudinal panel methodology employed in recruiting households, and maintaining participation rates, without inducing biases that are known to be problematic for travel measurement.

3 Methodology

There are two aspects of the methodology for this paper. The first is an overview of the survey methodology used to collect vehicle usage data from households, and the second is the methodology employed in the analysis of the response, reminder and demographic data presented in this paper. Each aspect is considered in turn.

3.1 Odometer survey methodology

The two areas chosen for study were selected for their exposure to TravelSmart initiatives. The South Australian sample was randomly selected by household address from all known household addresses in the area. The Victorian sample, however, was taken from a list of all residential addresses in the area that had not previously been participated in the short-term TravelSmart initiative in the year previous. While this was practically necessary to avoid repeatedly contacting the same households, it may have lead to some demographic bias in the sample.

Sampled household addresses were processed to match listed telephone numbers. Households with known telephone numbers were then posted a preliminary notification letter about the study from the sponsoring government agency. Shortly after, households were phoned by a market research company on behalf of Sydney University. Necessarily for an odometer study, households had to own at least one motorised vehicle to be included - households with no vehicles were screened out at recruitment. If recruitment was successful, details of the cars belonging to the household were collected over the phone so that the survey package could be customised for the household. Recruited households were given the choice of which method they wished to use to return their odometer readings: post, telephone, or Internet.

In contrast to multi-mode attitudinal surveys, we do not believe that the use of the different modes to return odometer readings and demographic information will have an impact on the variables measured. Rather, the provision of multiple response modes was used as an attempt to ensure a representative sample was recruited and maintained.

Because the respondent is required to leave the telephone to collect their odometer readings, and particularly because not all vehicles are necessarily at the residence at the time of the call, the survey task could not be completed in the recruitment phone-call. All households, irrespective of the way they wished to return the data, were posted hard copy forms. This provided the tools to collect the odometer readings from each vehicle and ensured that both telephone and internet responders knew the full scope of the questions they would be asked prior to the retrieval call or logging on to the website.

In the first wave, households were asked to complete a household and vehicle information form as well as customised cards for each vehicle's odometer reading. If households were slow to return their data, they were reminded by telephone and by post.

Three months later, households were recontacted with a telephone call to check that their contact details were still the same, to confirm the vehicles that they owned, and to ensure that they were willing to participate again. In subsequent waves, the forms were delivered to households with the details of the previous wave pre-printed so that they only needed to correct errors or update changes. In each subsequent wave some additional random replacement recruitment has been conducted to make up for households that drop out or that cannot be contacted. The process of completion and reminders was the same as for the initial wave.

At this time, four waves have been conducted for the quarterly odometer survey, the first having been undertaken in September 2005, the second in December 2006, the third in March 2006, and the fourth in June 2006. A fifth and sixth wave are being conducted, but Wave 5 data have not yet been cleaned and Wave 6 data are only just now being collected. Table 1 illustrates the timing of the survey waves and highlights some of the obstacles to response.

	2005				2006											
	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
South Australia	W1			W2 - Xmas			W3			W4			W5			W6 - Xmas
Victoria	W1			W2 - Xmas			W3 - C'wealth Games			W4			W5 - School Holidays			W6 - Xmas

Table 1:The timing of the survey waves

3.2 Response and mode analysis

There are many questions that could be asked of this survey relating to the character of response and respondents. This paper takes the first step in presenting some indicators of differences between the response modes – primarily it is concerned with assessing whether choice of response mode is an indicator of compliance with the survey task and whether respondents choosing different response modes have particular demographic profiles. It is hoped that in future analyses, the relationships between compliance with the research task and the demographic profiles of respondents can be modelled in more detail, but this is beyond the scope of the present work.

The analysis presented here quantifies the recruitment and return rates by response mode and explores the relative impact of postcard reminders. The rate of continuation and assessment of compliance in subsequent waves is presented. The results conclude with a brief exploration of the stability of the sample demography across the four survey waves and an exploration of differences between respondents by response mode.

4 Results

4.1 Initial recruitment and return rates by response mode

Respondents were offered a choice of three methods for returning their odometer surveys to the University and there was a marked difference in the take up rates between the three methods. The postal return method was the preferred method in both South Australia and Victoria, followed by the Internet, with the telephone clearly the least preferred retrieval method. Table 2 demonstrates these differences. Those households that did choose to use the telephone were the most likely to comply with the survey task, followed by Internet households, and then by postal households

		South	Australia		Victoria				
	Post	Phone	Internet	Total	Post	Phone	Internet	Total	
Sample				1242				2270	
Ineligible*				431				825	
Known Refused				490				766	
No Contact				2				299	
Recruited	248	16	55	319	232	36	112	380	
Recruitment Rate**	30.6%	2.0%	6.8%	39.4%	17.4%	2.7%	8.4%	28.4%	
Proportion of recruited	77.7%	5%	17.2%	100%	61.5%	9.5%	29.5%	100%	
Returned Data	154	12	39	205	139	26	73	238	
Return Rate***	62.1%	75%	70.1%	64.3%	59.9%	72.2%	65.2%	62.1%	

Table 2: Recruitme	nt by respor	nse mode in Wave 1
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*Ineligible households are those with no vehicle, with a mismatched/invalid phone number

** Recruited/(Known Eligible + Estimated Eligible)

***Returned Data/Recruited

Of those households recruited in Wave 1, 64% of South Australian households returned their forms and 62% of Victorian households returned data. While respondents in this survey are participating in a lower burden survey in each wave than traditional travel surveys, households know at recruitment that they are being asked to do the survey at high frequency for an extended period.

Over the course of the survey the researchers have had some anecdotal evidence from respondents, that those households choosing the Internet as a return method may be more sensitive to a perceived over-supply of correspondence from the researcher. That is, continuing to call and send postcard reminders may have a negative impact on the return rate from those households that wish to use the Internet.

We therefore tested to see whether there was any difference between the response modes on the relative success of receiving data back from households. The results are presented in Table 3 and demonstrate that there is a significant difference in the success of obtaining responses after sending reminder postcards at the initial recruitment phase to post and Internet households. Note that telephone retrieval households are called by the researcher and that, therefore, each call-back acts as a form of reminder call; they are therefore not supplied with the same postcard and telephone reminders as post and internet households.

Table 3 presents a Chi-Square test of all those households sent reminder postcards in their initial wave of recruitment; that is, all households from Wave 1 as well as replacement households in Waves 2, 3 and 4. The actual counts show how many post and Internet households were sent reminder postcards and then either did or did not return data. The expected counts show the counts we would expect if there was no association between the response mode and the number of households returning data. The Chi-Square statistic is significant (α =0.05) with 1 degree of freedom, indicating that the chosen response mode and the likelihood of responding after receiving a reminder postcard are related.

	•	•	•				
		South Australia		Victoria			
	Postcard sent	Postcard sent	Total sent	Postcard sent Postcard sent		Total sent	
	and	and	postcard	and	and	postcard	
	data returned	data not returned	reminder	data returned	data not returned	reminder	
Actual Counts							
Post	106	115	221	82	83	165	
Internet	23	93	116	19	45	64	
Total	129	208	337	101	128	229	
Expected Counts							
Post	84.596	136.404	221	72.773	92.227	165	
Internet	44.404	71.596	116	28.227	35.773	64	
Total	129	208	337	101	128	229	
Chi ² Statistic		25.489			7.489		
Probability	0.000			0.006			

Table 3:Recruited households successfully returning of data after receiving a
reminder postcard by State and response mode

4.2 Subsequent waves continuation and return rates by response mode

In subsequent waves, all households that had not explicitly declined to continue were called back to confirm whether they were willing to continue in the survey. If the household agreed, they were sent a customised survey package in the post and return the information by post, telephone or Internet. Table 4 presents the continuation rates and return rates by response mode for the two states. The counts of households terminating their participation by response mode are so low as to preclude analysis.

Table 4:Proportion of eligible household confirmed willing to continue and
successfully returning data

			South A	ustralia		Victoria				
		Post	Phone	Internet	Total	Post	Phone	Internet	Total	
	No. of households eligible for recontact	152	12	41	205	133	28	73	234	
e 2	No. of households confirmed	144	12	31	187	121	24	60	205	
Nav	willing to continue*	94.7%	100.0%	75.6%	91.2%	91.0%	85.7%	82.2%	89.3%	
	No. of households returned	140	8	28	176	115	16	54	185	
	data**	97.2%	66.7%	90.3%	94.1%	95.0%	66.7%	90.0%	90.2%	
	No. of households eligible for recontact	180	14	52	246	151	28	77	256	
е 3	No. of households confirmed	172	14	45	231	138	25	62	225	
Wav	willing to continue*	95.6%	100.0%	86.5%	95.9%	91.4%	89.3%	80.5%	93.2%	
	No. of households returned	165	13	39	217	130	23	54	207	
	data**	95.9%	92.9%	86.7%	93.9%	94.2%	92.0%	87.1%	92.0%	
	No. of households eligible for recontact	187	14	52	253	145	27	70	242	
• No. (No. of households confirmed	181	13	48	242	135	22	64	221	
Wav	willing to continue*	96.8%	92.9%	92.3%	96.0%	93.1%	81.5%	91.4%	93.3%	
-	No. of households returned	174	12	40	226	135	19	58	212	
	data**	96.1%	92.3%	83.3%	93%	100.0%	86.4%	90.6%	96%	

*% is confirmed/eligible

**% is returned/confirmed

Even though households agreed to continue, this in no way guaranteed they successfully returned data. Table 5 presents the overall distribution of households returning data by response mode and state in any continuing Wave (i.e. all waves have been summed). Again, there are significant differences in the proportion of households complying with the task by response mode.

		South Australia			Victoria		
	HH confirmed	HH confirmed	Total HH	HH confirmed	HH confirmed	Total HH	
	willing to	willing to continue	confirmed	willing to	willing to continue	confirmed	
	continue and	but did not	willing to	continue and	but did not	willing to	
	returned data	return data	continue	returned data	return data	continue	
Actual Counts							
Post	479	18	497	380	14	394	
Telephone	33	6	39	58	13	71	
Internet	107	17	124	166	20	186	
Total	619	41	660	604	47	651	
Expected Counts							
Post	466.126	30.874	497	365.555	28.445	394	
Telephone	36.577	2.423	39	65.874	5.126	71	
Internet	116.297	7.703	124	172.571	13.429	186	
Total	619	41	660	604	47	651	
Chi ² Statistic		23.320			24.409		
Probability	0.000			0.000			

Table 5:Households successfully returning data in all subsequent waves by State and
response mode

4.3 Demographics by wave and by response mode

Due to the high levels of continuation in the survey the demographics of the sample are remarkably stable across each of the waves. Tables 6 & 7 illustrate the stability of the sample on variables of key significance to travel surveys. The mean displayed is calculated across those households that actually returned data any each of the given waves. While the magnitude of the mean is different in the two different areas, the changes between waves within each State are extremely small. Historically, travel surveys struggle to recruit either very large or very small households but, as Tables 6 and 7 demonstrate, the distribution of households is similar to that of the census. Note that the incidence of 1 person household is lower in the sample than in the census; this is due to the ineligibility of households without a vehicle for an odometer survey. Single person households are more likely to be zero car-owning than larger households. Therefore direct comparisons between the demography of the sample and that of the census are somewhat problematic. It is hoped that future comparisons can be made using unit record files so that demographic analyses can be limited to households owning vehicles.

Questions relating to income are often the most offensive to respondents and therefore most threatening to recruitment and continuation. Furthermore, it is usually a very poorly completed item on surveys, with much ambiguity about drawing distinctions between gross and net income and income from investments. It was deemed to be unnecessary to the evaluation of VKT to ask specifically about income. Instead, proxies such as highest level of education attained by each householder were asked; as Figure 1 illustrates, this variable also shows stability. While there may therefore be error associated with overall representation in the sample of high or low income earners, it does not appear that either group is particularly predisposed to terminating their involvement in the survey.

Table 6:Comparison of the Demographics for the Four Odometer Waves in SouthAustralia with 2001 Census Data for All Households*

Demographic (per household)	Value		South Australia Statistics					
		2001 Census – All Households	Wave 1	Wave 2	Wave 3	Wave 4		
Number of Persons	1	33.70%	21.60%	20.50%	23.20%	23.30%		
	2	34.20%	42.20%	41.90%	42.10%	41.30%		
	3	14.00%	15.20%	15.30%	13.20%	13.00%		
	4	12.10%	15.70%	15.30%	16.20%	16.60%		
	5+	6.10%	5.40%	7.00%	5.30%	5.80%		
Number of Vehicles	0	15.10%	0%	0%	0%	0%		
	1	44.10%	50.70%	50.70%	49.30%	48.20%		
	2	30.50%	38.00%	37.30%	38.00%	41.10%		
	3+	10.20%	11.20%	12.00%	12.70%	10.70%		
Average Number of Adu	ılts	1.9	1.96	1.98	1.98	1.97		
Proportion of Population	n Adults	80.30%	80.40%	79.60%	82.60%	81.5%		
Average Number of Chi	ldren	0.47	0.48	0.51	0.42	0.45		
Proportion of Population	n Children	19.70%	19.60%	20.40%	17.40%	18.5%		
Average Number of Males		1.15	1.15	1.2	1.18	1.18		
Average Number of Females		1.22	1.28	1.29	1.21	1.24		
Average Number of Full-Time Workers		0.62	0.79	0.69	0.69	0.68		
Average Number of Full	-Time Students	0.4	0.45	0.45	0.42	0.46		

* The South Australia census statistics are obtained by aggregating the Western Adelaide Statistical Subdivision (SSD 40510) with the Statistical Local Areas of Holdfast Bay North (SLA 405202601) and Holdfast Bay South (SLA 405202604) to approximate the evaluation zone.

Table 7:Comparison of the Demographics for the Four Odometer Waves in Victoria
with 2001 Census Data for All Households*

Demographic	Value		Victor	ia Statistics		
(per nousenoid)	2001 All He		Wave 1	Wave 2	Wave 3	Wave 4
Number of Persons	1	33.40%	18.9%	18.7%	18.3%	17.8%
	2	32.80%	28.6%	27.8%	29.4%	30.8%
	3	16.30%	15.1%	16.3%	14.2%	13.5%
	4	11.70%	24.8%	25.4%	24.9%	24.5%
	5+	5.90%	12.6%	12.0%	13.2%	13.5%
Number of Vehicles	0	17.90%	0.0%	0.0%	0.0%	0.0%
	1	45.80%	53.3%	55.2%	55.1%	56.5%
	2	28.40%	38.8%	38.1%	36.9%	35.4%
	3+	7.90%	7.9%	6.7%	8.1%	8.2%
Average Number of Adu	ılts	1.97	2	1.99	2.05	2.01
Proportion of Population	n Adults	82.60%	70.10%	69.30%	71.10%	69.90%
Average Number of Chi	ldren	0.41	0.85	0.88	0.83	0.87
Proportion of Population	n Children	17.40%	29.90%	30.70%	28.90%	30.10%
Average Number of Males		1.15	1.3	1.32	1.34	1.38
Average Number of Females		1.23	1.55	1.53	1.53	1.49
Average Number of Full-Time Workers		0.77	0.97	1.01	0.97	0.99
Average Number of Full	-Time Students	0.39	0.7	0.69	0.72	0.75

* Victorian statistics have been calculated from the Darebin-Northcote Statistical Local Area (SLA 205301891)



Figure 1: Mean number of university educated persons per household per wave

Given that the demography is fairly stable, it is therefore of interest to test for differences in the demography between the three response mode groups. Many of the variables are non-normally distributed and most variables had unequal variances by response mode. Therefore, Table 8 presents the results from Kruskall-Wallace H tests for each state on key variables with significant differences in distribution of response mode. The tests have been conducted on the household mean of each variable; that is, the mean of each variable for each household across the waves for which the household reported data.

The results of the Kruskall-Wallace tests show that the demographic difference between the three response mode groups is much more pronounced in South Australia than in Victoria. In South Australia, there are significant differences in all but two of the demographic variables presented. In Victoria, however, there are only four variables that differ significantly. More research on household access to and experience with the Internet in the two localities may shed additional light on this issue.

Variable		South A	Australia	1	Victoria			
		Phone	Net	Chi-Sq	Post	Phone	Net	Chi-Sq
Mean Rank of No. Persons per HH	128.9	101.7	150.9	6.353*	131.3	140.9	138.3	0.686
Mean Rank of No. Vehicles per HH	127.0	116.4	159.2	9.722*	136.4	127.0	136.5	0.437
Mean Rank of No. Males per HH	126.1	118.9	156.6	9.591*	130.6	126.0	142.8	7.966
Mean Rank of No. Females per HH	133.2	107.3	134.1	1.952	133.0	150.4	130.7	1.96
Mean Rank of No. Full-time workers per HH	124.3	110.6	162.6	13.729*	124.9	121.2	153.1	9.352*
Mean Rank of No. Full-time students per HH	126.4	114.6	154.1	10.563*	127.4	140.9	142.2	2.951
Mean Rank of No. 0-14yo per HH	128.4	108.3	151.0	9.166*	133.3	144.6	133.5	0.633
Mean Rank of No. 15-44yo per HH	126.7	106.6	157.7	10.037*	124.6	151.3	147.4	6.802*
Mean Rank of No. 45-64yo per HH	128.9	124.3	145.3	2.399	131.8	122.2	143.4	2.246
Mean Rank of No. 65+yo per HH	139.7	157.7	97.6	21.323*	144.0	131.2	118.1	14.708*
Mean Rank of No. university educated per HH	129.2	89.1	159.0	15.906*	123.3	131.7	160.7	14.138*

Table 8: Results of Kruskall Wallace tests for difference in demography between response modes

*Significant at .05 level

Of course, there is likely to be correlation between some of these variables, but it was outside the scope of this presentation to investigate these any further. It is expected that analysis produced at the completion of the sixth wave will provide further details about the character of the household profiles by response mode.

5 Discussion

The results presented here clearly demonstrate differences in the response and demographic characteristics of households in this longitudinal panel survey. Households – in both Adelaide and Melbourne – are most likely to choose the post as their preferred response mode. While Internet surveys may be increasingly acceptable to the population, the experience here would suggest that the postal return method is still preferred overall.

The results presented here suggest that postcard reminders have greater success in prompting return from households choosing the post than households choosing the Internet. This is, perhaps, unsurprising; households choosing to use the Internet may well find hard-copy correspondence irritating, or be more likely to ignore correspondence in that form. In response to this finding, the researchers began collecting email addresses from continuing households from Wave 4 onwards to facilitate sending reminders electronically.

It is important to note, however, that the lower effectiveness of reminders to Internet households does not result in a lower return rate than postal households (see Table 1) – in fact, it is quite the opposite. This may be a result of the rapidity with which the researcher knows when Internet households have completed the survey; that is, reminder postcards are only sent to households failing to return data, but the delay in the postal system may mean that households that have already returned data by post still receive postcards. Because this survey was not established as an experiment in the impact of reminders, there will always remain some ambiguity as to the effect across modes.

While the demographic profile of responding households appears to have some significant differences by chosen response mode, the continuation rates and demographic profile of the entire sample are particularly stable across all four waves. This is encouraging, as it suggests that the multi-mode panel design does not bias the sample in ways additional to any bias existing at the point of recruitment. Allowing households with higher levels of full-time workers and 15-49 year olds, who are typically under-represented in travel surveys, to utilise the Internet as a response mode (see Table 8), may have improved the representativeness of the sample over an equivalent single-mode survey.

Despite the excellent compliance rate of telephone return households, the very small proportion of households that choose to use the telephone as a response mode, may indicate that for a survey such as this it is unnecessary to provide this alternative. This survey is different from many CATI surveys in that there must be at least two phone conversations with the respondent – one at recruitment and one to retrieve the odometer readings – because the respondent must leave the phone to take down the reading from the vehicle's odometer and, more importantly, not all household vehicles are guaranteed to be home at the time of recruitment. Those households that choose to use the phone may well have been willing to have used the post or Internet; it would be of further interest to test this theory in an exit interview.

There are many directions in which to develop the preliminary investigations presented here. It will be of great interest to analyse the developments through Waves 5 and 6, which are taking place without sample replacement. While this paper has presented some interesting statistics on the differences between the three response populations, there are specific directions in which it ought to be advanced in the future. Specifically, it would be worthwhile to compare the sample demography to census statistics limited to car owning households and to model the likelihood of compliance by response while controlling for demography.

6 Conclusion

While the survey under examination is not an experiment to test the impact response mode, it does provide some interesting insights into the character of response and respondents when provided with choice in response mode between the post, telephone and Internet. In both Adelaide and Melbourne, post is the preferred option for responding to the survey, followed by the Internet with telephone retrieval least preferred in both areas. At initial recruitment, households choosing to use the post to return their survey forms are more likely to respond after receiving postcards reminders than households that opted for the Internet. Perhaps unsurprisingly, there are significant differences in the demographic profile of households choosing different response modes and we have shown that there is a significant difference in the return rate from households in subsequent waves between these modes. Yet the demographic profile of the entire sample is relatively stable across four waves of data collection. This is an encouraging finding in support of offering multiple response modes as a technique for striving for and maintaining a representative sample in a longitudinal panel survey.

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