

Willingness to participate in travel surveys: A cross-country and cross-methods comparison

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Note: This is an abridged version of the paper originally presented at ATRF 2018. For further information about this research, please contact the authors

Abstract

Travel surveys are the primary source of data that feed into the analysis and modeling of travel behaviour. Numerous studies have found that the survey method, be it pen and paper, online, interview, smartphone app, or GPS, impacts participation, diligence and accuracy of reporting. In turn, this can lead to bias both in terms of the socio-demographic mix of respondents, and under/mis-reporting of trip information. To date, there is limited understanding of if/how preferences for particular travel survey methods vary across countries. In 2014, a survey of 17,510 adults from 24 countries was undertaken by an internationally-renowned market research firm to assess preferences for different survey methods. The current paper focuses on responses from five of these countries with long-standing household travel surveys - Australia, USA, France, Germany, and Japan. Results suggest that for a given survey method, willingness to participate in travel surveys varies across countries and within each group of respondents (classified by their socio-demographic characteristics). Australians tend to have a higher willingness to participate across different survey methods compared to their counterparts, particularly from Japan. In terms of socio-demographic characteristics, younger respondents tend to engage in travel surveys regardless of the method, while females are more likely to prefer diary-based methods than mobile-based methods. Respondents also appear to trade-off effort in completing travel surveys using traditional methods against privacy issues surrounding mobile-based methods. Results suggest that there is no 'one size fits all' methodology for travel surveys, with designers needing to carefully consider both socio-demographic and cultural differences.

1. Introduction

Across the globe, travel surveys remain a key bedrock of an evidence-based rationalization of transportation planning and policy decisions. Although there is a consensus in the saliency and primary utility of travel surveys as a data source for evaluating transportation alternatives, the context by which travel data is collected varies methodologically and geographically. For instance, Australia has maintained a face-to-face component for most of their surveys, while the United States largely uses telephone and web-based methods. With technological innovation, however, many countries, are now grappling with the opportunities and challenges presented by the potential of mobile technologies such as GPS and smartphones as survey methods (Bhat, 2015; Safi et al., 2014; Jariyasunant et al., 2014). Challenges associated with different survey methods, both traditional and new, and the impact on participation have been well-documented (Stopher and Greaves, 2007; Richardson et al., 1995; Groves et al., 2004). Among these challenges, declining participation is considered to be prevalent across most

countries (Stopher and Greaves, 2007; Zimowski et al., 1997; Eisenmann et al., 2018). The combination of the decline in telephone usage and the increase in respondent burden (from survey saturation and the time demanded to complete traditional surveys) have contributed to such problems. To resolve the issue, survey researchers have explored alternatives to conventional methods to capture hard-to-reach socio-demographic groups, experimenting with mixed-method methods (Eisenmann et al., 2018;) and mobile-based technologies (Geurs et al., 2015; Zhao et al., 2015, Safi et al., 2013). These explorations, however, have been done independently, either focusing on one specific geographic area or a specific survey method and subsequently comparing the outcome with a traditional method (Verreault and Morency, 2018; Eisenmann et al., 2018). Thus, there remains paucity of information around whether the survey methods are homogenous in terms of their effectiveness in different cross-country domains.

2. Objectives & Data

With these issues in mind, the current paper investigates how preferences for different travel survey methods varies by socio-demographics and country. The paper uses a unique online survey conducted across 24 countries by Ipsos, an internationally-renowned market and social research firm over 2 weeks in September 2014. In total, 17,510 complete responses were obtained. The survey questioned how likely people were to take part in a survey using various methods covering traditional approaches (diaries, interviews) and more contemporary approaches (online, GPS, smartphone-based, life-logging cameras). Participants were also asked why they might not choose to participate in a survey using a particular approach.

3. Results

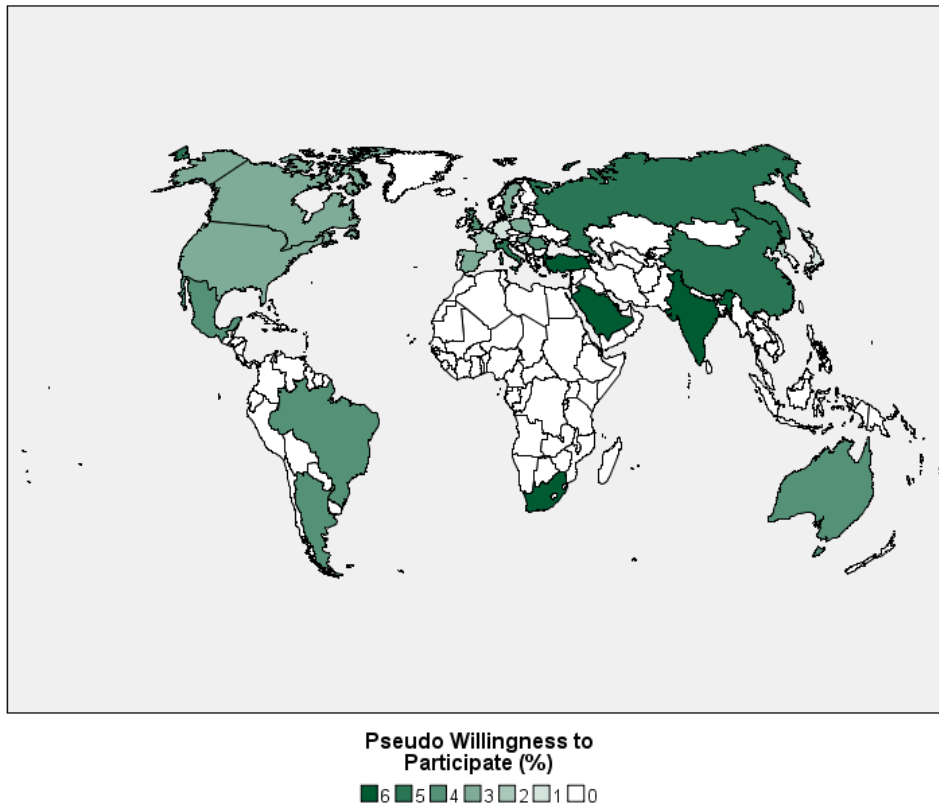
3.1. Cross-National Differences

Figure 1 contrasts the willingness to participate (WtP) across all 24 countries surveyed - note, this is taken as respondents who indicated they would definitely or probably agree to participate. For the purposes of presentation, we took the average of the respondent's likelihood to participate across the eight survey methods, what we coin a 'pseudo-WtP'. Evidently, there are marked differences by country with the highest pseudo-WtP in India (59%), Turkey (47%), Saudi Arabia and South Africa (46%), and China (44%) and the lowest in Japan (14%), Germany (23%), France (26%), Belgium and South Korea (27%). Most countries were in the 30%-40% range. A One-way Analysis of Variance (ANOVA) test provided statistical confirmation of the pseudo-WtP variation across countries ($F=39.811$, $p\text{-value}=0.000$).

3.2. Differences in Survey Methods

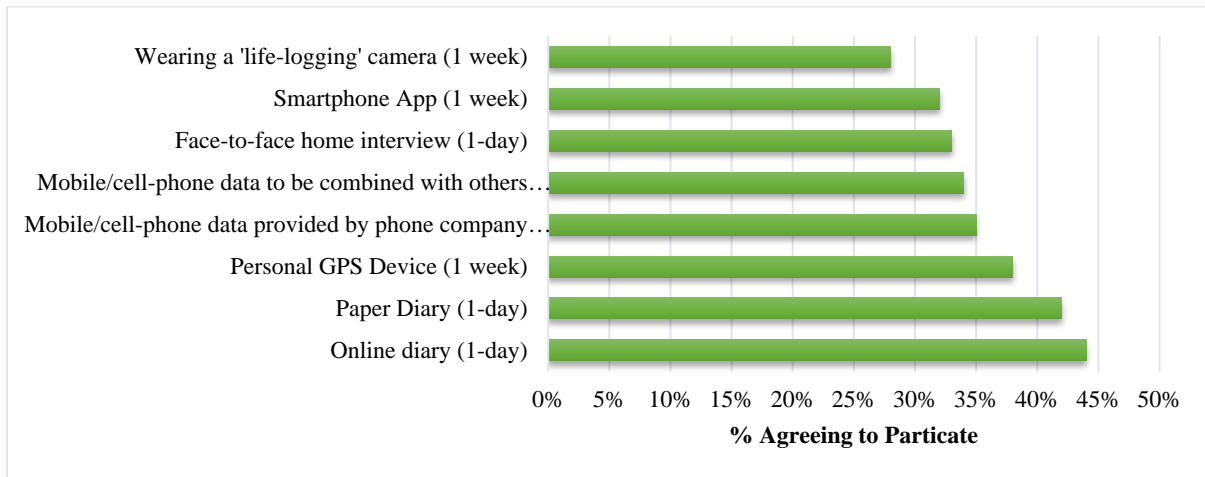
In terms of the survey methods, over all countries the online diary was the most popular with a WtP of 44% (Figure 2). This may have reflected the Internet-based method of recruitment, but it is interesting that (arguably) the most traditional method of the eight, the paper diary, was a close second with 42% of participants indicating a WtP. Around 38% indicated they would be willing to carry a small, personal GPS device for one week and this was the most popular choice in one country, Mexico (43%). Around 35% indicated they would allow their mobile/cell data to be collected over several weeks and used either for understanding their own travel or combined with others to give a broad understanding of travel – interestingly, this latter option was the most popular method in Saudi Arabia (53%). Around one-third of participants were willing to conduct a face-to-face interview with a similar proportion willing to download an app onto their own smartphone for one week. The least popular approach overall was the wearing of a small 'life-logging' camera for one week with the purpose of taking photos of exact locations every few minutes.

Figure 1: Indication of Willingness to Participate in a Travel Survey



Note: 1 = <25%; 2 = 25%-30%; 3 = 30%-35%; 4 = 35%-40%; 5 = 40%-45%; 6 = >45%. 0 = no data

Figure 2: Willingness to Participate by Survey Method (All Countries)



3.3 Binomial Logistic Regression Analysis

Binomial logistic regression analysis was used to statistically compare participant WtP across five of the countries with long-standing household travel surveys; Australia, France, Germany, Japan, U.S. Table 1 summarises the odds ratio (Probability of yes to a survey request)/Probability of no to a survey request). In terms of age, the results suggest that in general younger respondents (aged 16-34 years old) are more likely to participate than older respondents (50-64 years old) for the paper, online and app-based methods. For instance, the first cell in Table 4 (1.592) indicates that the odds for those 16– 34 years old to participate in a

paper survey is 59.2% higher than the odds for those 50-64 years old (the reference group). Females appear to prefer a paper or online survey method to males while the opposite is true for GPS and app-based methods, with no significant difference for the interview method. Respondents who are either married or in a relationship indicate a stronger preference for traditional surveys (paper, online, and interview) with no statistically significant difference for the GPS or app-based surveys. Chief income earners and those making more use of social media appear generally more likely to indicate a preference for completing a travel survey, irrespective of the method employed. Although not statistically significant, employed respondents prefer app-based survey methods than un-employed or retired respondents – an opposite effect than the other survey methods.

Table 1: Odds Ratio Results of Willingness to participate by survey method

	Paper	Online	Interview	App	GPS
	Odds (95% Confidence Interval)				
<i>Age</i>					
16-34 years old	1.592*** (1.335-1.898)	1.622*** (1.356-1.939)	1.129 (0.931-1.369)	1.829*** (1.497-2.236)	1.151 (0.960-1.381)
35-49 years old	1.118 (0.949-1.318)	1.197** (1.013-1.414)	1.043 (0.870-1.251)	1.376** (1.133-1.671)	1.177* (0.993-1.395)
50-64 years old	Ref				
<i>Gender</i>					
Female	1.620*** (1.409-1.862)	1.334*** (1.158-1.536)	0.951 (0.816-1.108)	0.812** (0.693-0.950)	0.869* (0.754-1.003)
Male	Ref				
<i>Chief income earner</i>					
Breadwinner=Yes	1.394*** (1.196-1.624)	1.544*** (1.322-1.802)	1.542*** (1.302-1.827)	1.418*** (1.193-1.686)	1.338*** (1.144-1.565)
Breadwinner=No	Ref				
<i>Marital status</i>					
Married/ Domestic Partnership	1.235** (1.073-1.420)	1.288*** (1.118-1.484)	1.208** (1.036-1.410)	1.100 (0.940-1.287)	1.114 (0.965-1.286)
Otherwise	Ref				
<i>Employment status</i>					
Employed	0.906 (0.770-1.065)	0.979 (0.830-1.155)	0.884 (0.739-1.058)	1.081 (0.892-1.310)	0.966 (0.817-1.143)
Student	0.890 (0.678-1.168)	1.111 (0.845-1.461)	0.979 (0.722-1.328)	1.134 (0.841-1.531)	0.845 (0.635-1.124)
Unemployed or retired	Ref				
<i>Social Media Usage</i>					
Daily	1.249** (1.055-1.480)	1.414*** (1.190-1.681)	1.515*** (1.246-1.841)	1.638*** (1.335-2.009)	1.555*** (1.298-1.861)
Weekly	1.312** (1.057-1.629)	1.631*** (1.311-2.027)	1.498** (1.177-1.906)	1.424** (1.102-1.838)	1.775*** (1.418-2.222)
Monthly	1.007 (0.779-1.302)	1.084 (0.833-1.411)	1.243 (0.931-1.658)	1.105 (0.808-1.510)	1.249 (0.955-1.633)
Never	Ref				
<i>Country</i>					
Australia	2.009*** (1.651-2.446)	2.496*** (2.041-3.052)	1.440** (1.172-1.770)	1.785*** (1.444-2.205)	1.478*** (1.216-1.795)
Germany	1.155 (0.946-1.410)	1.348** (1.101-1.650)	0.897 (0.723-1.112)	0.824 (0.655-1.037)	0.749** (0.610-0.919)
Japan	0.658*** (0.529-0.819)	0.705** (0.563-0.883)	0.388*** (0.298-0.505)	0.515*** (0.395-0.672)	0.419*** (0.331-0.529)
USA	1.687*** (1.385-2.055)	2.379*** (1.948-2.907)	1.074 (0.869-1.327)	1.255** (1.009-1.562)	1.134 (0.931-1.381)
France	Ref				
Cox and Snell R-square	0.067	0.090	0.052	0.065	0.060
χ^2/df	293.666/14	395.581/14	224.514/14	280.721/14	246.608/14

***Significant at 1%, **Significant at 5%

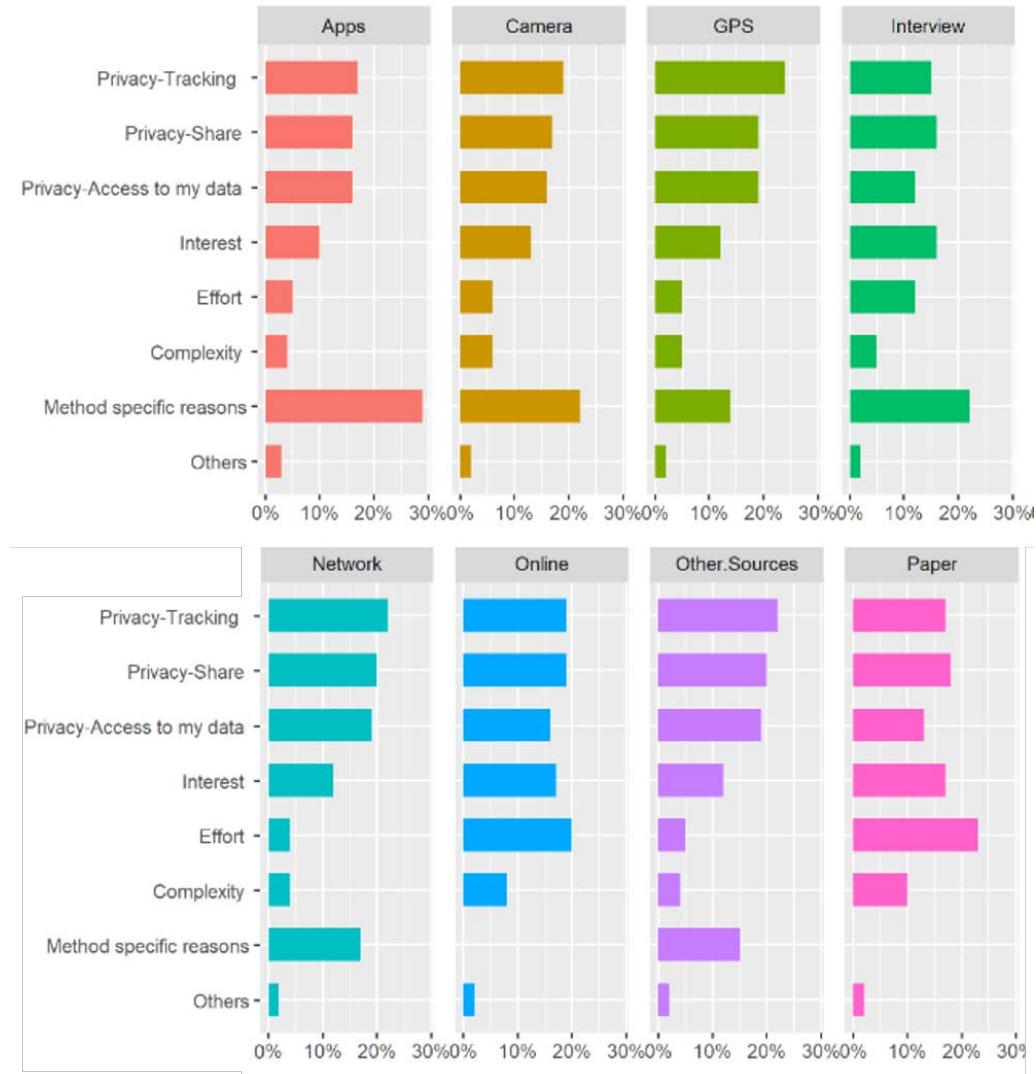
Odds ratio = $P_{\text{Participate (Target)}}/P_{\text{Non-participate (Ref)}}$

In terms of cross-national differences, the results largely re-confirm the descriptive analysis with the additional insight that there are significant issues remaining after controlling for the measured socio-demographics. Taking France as the reference, Australia and the USA have a significantly higher WtP across all five survey methods. This is most pronounced for the online and paper methods and less so for the other methods. Germans are significantly more WtP in paper/online surveys, but significantly less likely to participate in GPS-based surveys than their French counterparts. The Japanese are less likely to participate than the French across all survey methods. All five models with predictors (for each survey method) are better than an intercept-only model with the general model being significant at the 99% level of confidence using a Chi-squared test.

3.4. Reasons for non-participation

Figure 3 summarises the reasons selected by respondents for non-participation. Evidently, there is a trade-off between perceived effort and privacy. For example, respondents who declined to participate in paper and online surveys did so because these methods sound too time-consuming, but this does not seem to be an issue for mobile-based technologies. In contrast, privacy concerns weigh more for respondents who declined to participate in survey methods that use real-time location tracking. In the case of a face-to-face interview, respondents who refused participation may be wary of having a stranger interview them at their home.

Figure 3: Reasons for non-participation in each survey method



4. Discussion & Conclusions

This paper explores if/how the preferences for various types of travel survey approaches varies across socio-demographics and countries. Drawing from a unique survey of over 17,000 participants from 24 countries, the first insight to be drawn is that survey non-response appears likely to remain a major issue with more than half of participants indicating an unwillingness to complete a survey irrespective of method. However, evidently the method is highly significant in influencing levels of response, with overall a preference for diary-based methods, whether they be online or traditional paper-based. New technological approaches may offer promise in terms of convenience, less response burden, and greater data accuracy, but continue to be undermined by concerns over privacy. Results suggest significant demographic

differences with younger respondents and those making heavy use of social media indicating a greater willingness to participate in travel surveys regardless of the method, while females are more likely to prefer diary-based methods than mobile-based methods. Intriguingly, there is a suggestion that willingness to participate in travel surveys varies markedly by country (after controlling for demographics) ranging from as low as 14% in Japan to 59% in India, with most nations in the 30% - 40% range. We can only speculate as to the reasons why, but evidently there may be genuine cultural issues (Hofstede, 1980) at play here around willingness to divulge one's (travel) behaviour.

As with any study of this nature, there are cautionary notes on interpretation. First, this was an Internet-based convenience sample, which despite increasing ubiquity excludes certain population segments and varies markedly by country. This may have also influenced the apparent popularity of online survey methods, although it is notable that the traditional paper methods were just as popular. Second, while every effort was made to translate questions precisely, we cannot guarantee they were interpreted the same across countries. Third, stated willingness to participate provides no assurance that this would be converted into actuality. Lastly, the survey was limited in the extent to which the actual burden faced by respondents could be described. Nonetheless, the results suggest that there is no 'one size fits all' methodology for travel surveys, with designers needing to carefully consider both socio-demographic and cultural differences.

5. References

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