

Factors affecting response to travel surveys in adults: Results from a pilot study

Ashish Ravi Joshi¹, Shruti Shinde², Minaxi Rai Sharma³

¹Department of Civil Engineering, Rajarshi Shahu College of Engineering

²Department of Civil Engineering, Rajarshi Shahu College of Engineering

³Department of Civil Engineering, Rajarshi Shahu College of Engineering

Abstract -Surveys are data collection tools that serve the purpose of collecting data that are otherwise not available. Conventionally, data collection surveys for transportation planning include the use of a questionnaire survey. The objective of the study is to administer two types of surveys (questionnaire and flashcards) and compare and contrast each survey based on response rate, response time, and response quality. The survey was administered to adults in 35-60 years of age. Based on these results the study aims to define a survey that is a combination of the best parts of each of these surveys. This paper hypothesizes that the time, rate, and quality of response vary as a factor of the diversity in age, income, level of education, languages spoken and understood, and classification of the area (urban/rural/mix, etc). Response rates also vary depending on the behavioral tendencies of the respondents. The researchers intend to carry out the pilot survey in the suburban area of Pune city. The city of Pune is the eighth-most populous city in India and is also a major industrial city. The population of Pune is a mix of migrants from all over the country. The literacy rate of Pune is about 87.2%. While Marathi is the official language, other languages spoken include Hindi, Kannada, Gujarati, and English.

Key Words: transportation planning, travel survey, response rate, travel survey comparison

1. INTRODUCTION

Conventionally, data collection surveys for planning include the use of a questionnaire survey. We hypothesize that the time, rate, and quality of response vary as a factor of the diversity in age, income, education, languages spoken and understood, and geographical area (urban/rural/mix, etc). Response rates also vary depending on the behavioral tendencies of the respondents. Some might promptly fill the survey, some need a reminder and some never fill the survey. In such diverse situations, it is important to design the surveys in a way that will achieve responses from as diverse groups of the demographic as possible. This is essential to understand the needs of all the different groups of the community and plan for their benefit accordingly. In this pilot research work, adults in the age group of 35-60 years are the target group.

This research aims to administer two types of surveys (questionnaire and flashcards) and compare and contrast each survey based on response rate, response time, response quality, and then based on these results we aim to define a survey that is a combination of the best parts of each of these surveys. The research group intends to study how the type of survey and the

socio-economic characteristics of the commuters as well as their behavioral response to surveys, affect the data collection exercises.

2. LITERATURE REVIEW

The Internet has changed the working of the world. Before the late 1990s, there were two mediums to conduct a survey — either by telephone (an interview) or by mail (a questionnaire)—but only recently has it become possible to conduct surveys using the Internet (Hoonaker et al., 2019). Kwak (2002) studied and compared the respondent profile, response rate, and data quality by administering a mail survey and an email web-based survey. Safi (2017) compared 4 technology-mediated travel survey methods. The survey method, be it pen and paper, online, interview, smartphone app, or GPS, impacts participation, diligence, and accuracy of reporting (Versoza, 2018). Surveys are established methods for collecting population data that are unavailable from other sources, however, response rates to surveys have been declining for the last 30 years (Harrison et al., 2019). Potential respondents' technology-related uneasiness or perceived difficulty in completing an online questionnaire may be responsible for lower response rates in Internet surveys (Hoonaker et al., 2019). Since the 1990s travel behavior data has been collected with "household" or "origin-destination" surveys in person, over the phone, or on the internet. These methods, however, suffer from the trip under- and misreporting, and face declining response rates, particularly among young adults. Researchers quickly identified the potential to use smartphones for data collection (Patterson et al., 2019). Respondent satisfaction with any survey instrument, travel surveys included, impacts on their broader engagement with the survey topic, and is critical to data quality (Roddiet al., 2019)

Kwak et al. (2002) administered postal mail and e-mail surveys to a randomly selected sample size of 1000 each. The researchers found that the mail surveys had higher response rates, while web-based surveys had higher response speeds. With repeated contacts, response rates for both the surveys increased. Saifi et al. compared four technology-mediated travel survey methods in terms of ease of interaction with participants, demographic attributes of the participants, quality of collected data, and then share and frequency of reported mode of transportation.

Web-based questionnaires, handheld GPS (H-tracker), a smartphone application (S-tracker), and The Advanced Travel Logging Application for Smartphones (ATLAS) II were compared by Saifi et al. The researchers invited commuters to participate in the survey. The researchers concluded ATLAS II

has the highest quality of data while the S-tracker has the lowest quality of data. To ensure sample representativeness, the researchers emphasized combining different methods of data collection.

Versoza et.al (2018) studied the willingness of people to participate in a given travel survey over a group of respondents from - USA, Germany, France, Japan, and Australia. The researchers classified the respondents based on socio-demographic characteristics. The researchers conclude that decision-makers must consider the socio-demographic characteristics while deciding on the type of survey to be administered.

Harrison et.al (2019) compared two pilot maternity surveys to delineate methods that can increase response rates. The survey characteristics that the researchers varied over the two surveys were: pre-notification, number of reminders, quick response codes, the timing of reminders, length of questionnaires, and the design of questionnaires. The researchers conclude that a combination of these characters increases the response rate modestly.

Hoonaker et.al (2019) examined 29 studies that directly compared different survey methods (post, fax, e-mail, and web-based). Some of the recommendations made by the researchers to increase the response rate in web-based surveys: address privacy concerns, password-protected surveys, provide incentives, pre notifications, and reminders.

Schmid et.al (2019) studied the response behavior of the respondents to the travel survey administered. The researchers concluded that long-duration/multistage surveys report lower response rates but they add valuable data for policy making. The researchers recruited respondents and instructed them prior to administering the survey to reduce drop-out incidences. The researchers conclude that shorter questionnaires with higher incentives report higher response rates.

Roddis et.al (2019) compared 3 travel survey instruments: a paper-based survey, a smartphone survey, and a free form travel description, on the parameter of respondent satisfaction and preference. The researcher notes that the reporting of travel information is entirely dependent on the motivation and conscientiousness of the respondents. The survey participants were limited to a digitally savvy smartphone generation in Melbourne. The results from this study indicate that people are able to report their travel using different methods, but that the data outcomes—even for the same travel day, and using participants primed to think about travel reporting—are not perfectly aligned. The researchers conclude that differences between survey instruments may be nuanced or immaterial and therefore there is a need for administering a simpler and more enjoyable survey.

While some work has been done in comparing the different survey methods/instruments and technology, there still seems to be a gap when it comes to taking the socio-economic characteristics (income, age, education, literacy, lifestyle, and attitude) and behavioral response to surveys, into consideration for travel surveys. This work aims to consider such diversities and add to the already existing literature. This work is specific

to suburbs of Pune and Pimpri-Chinchwad, a city in India. The city of Pune is the eighth-most populous city in India and is also a major industrial city. The population of Pune is a mix of migrants from all over the country. The literacy rate of Pune is about 87.2%. While Marathi is the official language, other languages spoken include Hindi, Kannada, Gujarati, and English.

3. METHODOLOGY:

Given the covid-19 pandemic situation, an online questionnaire and flashcard survey were administered to 160 and 184 people in the first pilot exercise respectively. The respondents were given one week's time. Reminders were sent to all the respondents on the third, and seventh days. The participants for each of the surveys lived in the same gated community. For the questionnaire survey, the participants lived in a gated community (society) at Balewadi, a suburb of Pune and for the flashcard survey, the respondents lived in a gated community at Wakad, a suburb of Pimpri-Chinchwad. The survey was administered online via groups on messenger applications. Two google forms were created: one with a questionnaire and the other with flashcards.

The questionnaire, as well as the flashcard survey, were bilingual (English and Marathi). Each question in the surveys was a multiple choice type of question. A detailed description of the research was provided before the questions on each of the surveys in English and Marathi along with the contact details of the researchers. Both the types of surveys had the same questions but for the flashcard survey, the answer choices included pictorial representation while for the questionnaire survey it was a text. There were 9 questions in both surveys. Please refer to the appendix for both the survey questions.

3. RESULT AND CONCLUSIONS

The questionnaire survey registered a response rate of 5.625% while the flashcard survey registered a response rate of 1.086%. The group was a uniform mix of men and women respondents. The majority of the individuals were working from a different location other than their home. The age group of the individuals ranged (age group and numbers).

It was observed that the percentage of respondents was very low in both cases. Even with low responses, the questionnaire survey gathered more responses as compared to the flashcard survey. Noting that the survey was administered to the participants in the age group of 35-60, via online media, it can be concluded that a major factor behind the poor response was the comfort level of using online media. The responses remained low, although the participants were, from the same gated community as the researchers. This suggests that a formal meeting about the survey (just like the community meetings) prior to the implementation of the surveys online, would have increased the response rate. This also suggests that people are less likely to complete a survey voluntarily. Further, the results suggest that although using the internet increases the speed of communicating, it still fails to encourage people to voluntarily give less than two minutes to fill a survey.

Out of the responses received for the questionnaire survey, 77.77% were from male respondents. For the flashcard survey, only females responded to the survey. This aspect of how gender influences the survey responses still needs to be investigated further. All the respondents who filled the survey had attended university education with an income in the range of 50000-100000 Indian National Rupees.

This work is a pilot study of ongoing research work into understanding what affects the response rates to a survey and how. Due to the covid-19 pandemic, the research work was severely impacted in view of the health of the researchers as well as the general public.

In conclusion, the results of the research suggest that older adults have not yet become comfortable in using online modes for divulging information even with an anonymous survey. In such cases where the participants are older adults, a discussion with them before the implementation of the survey would prove beneficial in the survey exercise.

This research will further be extended to a larger audience, chosen randomly with various permutations and combinations of the different types of surveys and evaluating the response rate.

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APPENDIX

Questions in the survey:

Questions	Options provided
Please mention your PIN Code	N/A
Please mention your City Name	N/A
What is your education level	Primary School, Secondary School, College, University, Other
How did you go to your place of work before Covid-19	Walk, Cycle, Scooter/Bike, Car, Public Transport, Other
What other options did you have to travel to your office before Covid-19	Walk, Cycle, Scooter/Bike, Car, Public Transport, Other
How much distance do you travel for work	2-5 km, 5-10 km, 10-15 km, 15-20 km, 20-25 km, more than 25 km
What is your monthly income	0-5000, 5000-10000, 10000-15000, 15000-20000, 20000-25000, 25000-50000, 50000-100000, more than 100000
What is your gender	male, female, prefer not to say, other
Why do you use particular travel mode you selected above	convenience, affordable, safe, comfortable, time, other

Figure 1: Questions in the Survey