The Effect of an Interviewer's Career Length
on a Survey's Non-Response Rate

- A Case Study Encompassing Economically Active Population Surveys
in the Seoul Metropolitan Area -

Abstract

When the non-response rate in a survey increases, the quality of the survey's statistics becomes degraded due to the occurrence of a non-response bias. We can pre-suppose that the survey interviewer's career length – as a measure of one's experience in the field – is one of the determining factors that can lower the non-response rate. There are relatively few studies, however, on the relationship between an interviewer's experience and the non-response rate.

In this study, I divided a group of interviewers in charge of a particular survey in the Seoul metropolitan area into three groups based on how long they served as interviewers. I then investigated the non-response rate for an existing household survey group and a new household survey group. This took into consideration the sample replacement characteristics of the economically-active population survey in Seoul, South Korea. First of all, I confirmed whether there was a relationship between the interviewer's career length and the respondents' response status in the economically-active population survey. Subsequently, I analyzed whether there was a significant difference in the average non-response rate for each interviewer's career length group among the existing survey group and the new survey group.

The statistical assumption review of the variance analysis and the results of confirming the p-value are as follows. First, when analyzing the non-response rate of the existing survey group by the interviewers' career length, the average non-response rate was lower for the group with the most amount of experience. At a 95% significance level, however, it was not statistically significant that an interviewer's longer length of service produced a lower non-response rate. Based on this information, we did not discover a meaningful relationship between the interviewer's career length and non-response rates while allocating survey tasks to interviewers for an existing household survey group in progress.

When persuading the new survey group, however, we confirmed that the difference in the non-response rate according to the interviewer's career length was statistically significant at the 95% significance level. Through the post-hoc test, there was a significant difference in non-response rates between the group with less than three years of experience and the group with more than three years, but less than five years of experience. Through this study, we deduced that when trying to persuade new respondents to participate in a survey, it is possible to expect a positive effect on reducing the non-response rate by allocating work based on an interviewer's length of service.

Key Words: Interviewer, Survey Experience, Non-Response Rate

1. Introduction

Survey statistics play a vital role in providing the economic and social condition of a given country, allowing the government and companies to make informed policy decisions (Kim Ok-tae et al., 2013). It can be seen from the case of the National Statistical Office's survey field, however, that there are surprisingly many non-respondents in the process of preparing survey statistics. As such, a non-response bias occurs when a survey is studied only with the response data while ignoring the non-responses. Non-responses have a negative effect on the quality of statistical surveys, and a study on Non-Responsive Alternate Techniques and bias correction methods is in progress. In addition, these types of statistical data have statistical errors, including sampling errors and non-sampling errors (e.g., errors by interviewers, errors by survey items, etc.) (O'Rourke, Fowler & Mangione, 1991). Among them, the effect of the interviewers on the quality of the survey is called the Interviewer Effect. In the case of experienced interviewers, appropriate responses are obtained from the subjects through their appropriate skills and attitudes, whereas interviewers with short research experience may obtain the opposite results (Shin Seon-ok, 2008). Preventing respondents from quitting and obtaining sufficient responses from questionnaires are critical to a successful survey, particularly for long-term, repeatable surveys.

The most important factor is the role of the interviewers. Interviewers should not only read the questionnaires and help the respondents understand the content, but they should also motivate them to answer sincerely. A key factor for an interviewer to play such a role is the interviewer's prior experience. Interviewers obtained a lower non-response rate through experiences gained in the process of researching many respondents over a long period. Despite the interviewer's experience being an important factor in non-response rates, related studies are comparatively insufficient. In particular, it remains vital to investigate and analyze the effect of an interviewer's survey experience on the non-response rate to obtain better results while performing household surveys, particularly when managing interviewers with limited manpower. Therefore, the interviewers in charge of the economically active population survey in the Seoul metropolitan area were divided into three groups by their background. Then the frequency of non-responses to this survey was investigated for the existing survey household group and the new survey household group. Based on this, the significance of the interviewer's survey career length and the non-response rate have been statistically analyzed.


2. Methodology

1) Subjects and criteria for analysis

Several studies have shown that the socio-demographic characteristics of interviewers, such as gender and educational level, are not distinguishing variables influencing non-response rates (Groves & Couper, 1998; Lemon & Durand, 2002; Morton-Williams, 1993; Pickery & Roosevelt, 1998; Vassallo et al., 2015; West & Bloom, 2017). However, it is reported that the survey experience of interviewers with the same or similar experience had a positive effect on the survey response rate (Essig & Winter, 2009). Therefore, in this study, we investigated the influence of an interviewer's career length on the non-response rate.

The non-response rate was targeted at the sample replacement characteristics of the economically active population survey in South Korea. The Korea Economically Active Population Survey conducts a rolling sampling system that replaces a certain size of samples every month. If these sample households are newly-included in the survey area, then the household will be surveyed continuously for three years. If the household selected as a sample moves out of the area, then the new sample households moving into the survey area will be subject to the survey for the remaining three years. Three years after

being selected as a sample household, a new sample survey in an another area commences, and interviewers must persuade the citizens living in the new sample household to participate in the survey. After that, the number of non-responses may increase due to the respondents' fatigue in providing responses, privacy concerns, or due to the relocation of the households to be surveyed. The number of non-responses may decrease through continuous persuasion.

Therefore, an investigation attempted to determine whether there was a difference in the non-response rate according to the survey experience of the interviewers by dividing the economically active population survey in the Seoul metropolitan area as of June 2022 and the time when the new sample was replaced on April 2022 from January 2021. In consideration of the proportion for each group, the career length of the interviewers was divided into three groups: Less than three years of experience, more than three years but less than five years of experience, and more than five years of experience. As of June 2022, the results of the household sector survey of 242 interviewers of the Seoul Metropolitan Area Economically Active Survey and 196 interviewers in charge of persuading new households to participate from January 2021 to April 2022 are shown in <Figure 1> and <Figure 2>.
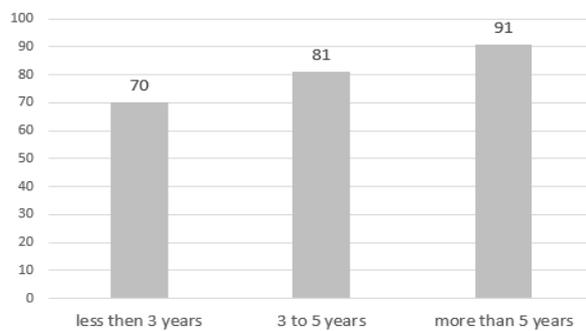
[Figure1] Number of interviewers differentiated by career length for the existing survey group.
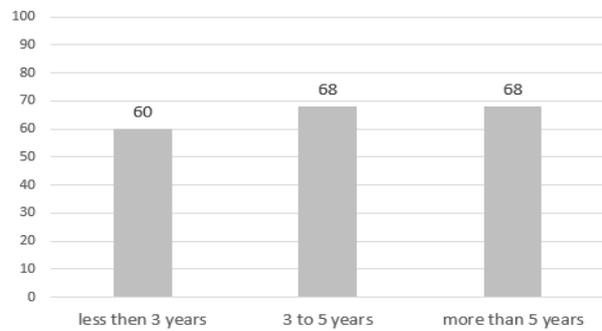
[Figure2] Number of interviewers differentiated by career length for the new survey group.

This was used as a tool to measure the effectiveness of persuasion for the non-response rate for each interviewer. The non-response rate is calculated by the following equation.

$$Non\text{–}Response\ Rate = 1 - \frac{\begin{array}{c}Number\ of\ households\ responding \\ to\ the\ Economically\ Active\ Population\ Survey\end{array}}{\begin{array}{c}Number\ of\ households\ eligible \\ for\ the\ Economically\ Active\ Population\ Survey\end{array}}$$

2) Statistical analysis

This study was analyzed using the SAS Enterprise Guide 7.1. A Chi Square Test was conducted to check whether there was a difference in the number of responses by the group to be persuaded by the interviewer's survey experience. After that, a one-way variance analysis was conducted to find out if there was a difference in the non-response rate by each survey experience. Afterwards, if there were a significant difference between groups as a result of the one-way variance analysis, then the Games Howell post-hoc test would have been performed. The Games Howell test is a post-analysis method applicable when it was not suitable for the assumption of equal variance of data in each group.

3. Results

1) Differences in responses and non-response rates with the economically active population survey of the existing survey group by an interviewer's survey experience in June 2022

<Table 1> shows the status of the number of responses by an interviewer's survey experience. The number of sample households included in the survey area allocated to 70 people with less than 3 years of experience was 2,683, of which 463 households did not respond, and the number of sample households allocated to 81 people with 3 to 5 years of experience was 2,894, of which 454 households did not respond. The number of sample households allocated to 91 people with more than 5 years of survey experience was 3,248 households, of which 452 households did not respond. First of all, as a result of checking whether or not it is related to the response by the interviewer's survey experience through a Chi-Square Test, it can be said that the respondents' responses were related to the survey experience of interviewers with the significance level of 0.05 at χ^2=12.61, p=0.002.

<Table1> Differences in survey response status by survey experience groups for the existing survey group in June 2022

		Career length			Total	χ2	p
		Less than 3 years	3 to 5 years	more than 5 years			
Response status	Response	2,220(82.7)	2,440(84.3)	2,796(86.1)	7,456(84.5)	12.61**	0.002
	Non Response	463(17.3)	454(15.7)	452(13.9)	1,369(15.5)		
		2,683(100.0)	2,894(100.0)	3,248(100.0)	8,825(100.0)		

* *p* < .05, ** *p* < .01, *** *p* < .001

<Table 2> shows the average non-response rate and standard deviation of the interviewer's career length. The average non-response rate for interviewers with less than three years of service was 17.3%. The non-response rate for interviewers with more than three years and less than five years of career length was 15.7%, and those with more than five years of career length stood at 13.9%. Based on the non-response rate of each interviewer, I would like to check whether it can be said that the longer the survey experience, the lower the average non-response rate. As a result of analyzing the difference in non-response rate by conducting an one-way variance analysis, there was no difference in the non-response rate by career length in the existing household survey with the significance level of 0.05 at $F(2)$=2.41, p=0.0923.

<Table2> Differences in non-response rate by survey experience groups for the existing survey group

Career length	The number of interviewers	Average non-response rate	Standard deviation	F	p
Less than 3 years	70	17.3	8.426		
3 to 5 years	81	15.7	7.421	2.41	0.0923
more than 5 years	91	13.9	8.753		

* *p* < .05, ** *p* < .01, *** *p* < .001

2) Differences in responses and non-response rate when persuading new survey groups with the economically active population survey by interviewer's survey experience

<Table 3> shows the status of the number of responses by survey experience. The number of sample households included in the survey area allocated to 60 people with less than 3 years of experience was 1,409, of which 260 households did not respond. The number of sample households allocated to 68 people with 3 to 5 years of experience was 1,530, of which 194 households did not respond. The number of sample households allocated to 68 people with more than 5 years of survey experience was 1,539 households, of which 210 households did not respond. As a result of checking whether or not it is related to the response by the interviewer's survey experience through a Chi-Square Test, it can be said that the respondent's response is related to the survey experience of interviewers with the significance level of 0.05 at χ^2=21.95, p=0.00.

<Table3> Differences in survey response status by survey experience groups when persuading household survey group from January 2021 to April 2022

| | | Career length | | | Total | χ2 | p |
		Less than 3 years	3 to 5 years	more than 5 years			
Response status	Response	1,149(81.6)	1,336(87.3)	1,329(86.1)	3,814(85.2)	21.95***	<.0001
	Non Response	260(18.4)	194(12.7)	210(13.9)	664(14.8)		
		1,409(100.0)	1,530(100.0)	1,539(100.0)	4,478(100.0)		

* $p < .05$, ** $p < .01$, *** $p < .001$

<Table 4> shows the average non-response rate and standard deviation of the interviewer's career length. The average non-response rate for interviewers with less than three years of service was 18.4. The non-response rate for interviewers with three years but less than five years of career length was 12.7%, and those with more than five years of career length was 13.9%. As a result of analyzing the difference in non-response rates by conducting an one-way variance analysis, there was a difference in the non-response rate by career length in the new household survey with the significance level of 0.05 at $F(2)$ =4.71, p=0.0107. Through the Games Howell post-hoc test, we examined which career length groups had significant differences. We found there were significant differences in non-response rates for the group with less than three years of experience and the group with more than three years but less than five years in career length.

<Table4> Differences in non-response rate by survey experience groups when persuading new household survey group from 2021 to April 2022

Career length	The number of interviewers	Average non-response rate	Standard deviation	F	p	Games Howell
Less than 3 years	60	18.4	11.687	4.71*	0.0107	3 to 5 years < Less than 3 years[a]
3 to 5 years	68	12.7	8.243			
more than 5 years	68	13.9	9.225			

* $p < .05$, ** $p < .01$, *** $p < .001$

[a] According to the Games Howell post-hoc test, there was a significant difference in non-response rate between the group with less than three years of career length and the group with more than three years and less than five years of career length at adj.p-value of 0.0075.

4. Discussion and Conclusion

In this study, we analyzed whether there was a difference in the non-response rates of the economically active population survey in the Seoul metropolitan area depending on an survey interviewer's career length and determined the following results.

First, when analyzing the non-response rate of the economically active population survey in June 2022 by the interviewer's survey career group, the average non-response rate was lower in the group with a longer survey career. However, at the 95% significance level, it was not statistically significant that an interviewer's longer the survey experience would result in a lower the non-response rate. This is presumed to have weakened the difference in non-response rates according to the interviewer's survey experience due to the influence of the survey's environmental variables, such as the accumulation of the respondents' survey fatigue and changes in the households. Based on this, we did not discover a meaningful relationship between the interviewer's career length and non-response rates while allocating tasks for existing surveys that were currently in progress.

Second, when persuading the new survey group, it was confirmed that the difference in the non-response rates according to the interviewer's survey career was statistically significant at the 95% significance level. In particular, through the post-hoc test, we found that a significant difference in non-response rates occurred between the group with less than three years of experience and the group with more than three years of experience but less than five years of experience. Through this, when persuading a new survey group, it is possible to expect a positive effect on reducing the non-response rates by allocating surveys to interviewers with more experience.

In addition, we saw that the average non-response rate of the group with more than five years of research experience was slightly higher than the group with more than three years but less than five years of career length when persuading the new survey group. According to Singer, Frankel & Glassman (1983), having little experience rather than no experience had a positive effect on the overall response rate. The longer the experience, however, a lower response rate could result as these interviewers were allocated a heavier workload or the more difficult survey cases. Specifically, experienced interviewers could be allocated to work in an area with a high-income level or a high proportion of single-person households, which are generally considered a factor that increases the non-response rate.

This study has regional limitations because it only covered the Seoul metropolitan area; therefore, to be a generalization, the study must use nationwide data. Moreover, other than the career length of the interviewer, additional study is needed on which variable sets could possibly affect the non-response rates of the economically active population survey (e.g., respondents' income level, respondents' residences, etc.) We remain keen to conduct follow up studies in this regard.

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