Effects of Forced Responses and Question Display Styles on Web Survey Response Rates

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Abstract

Researchers have increasingly adopted a web survey for data collection. Previous studies have examined factors leading to a web survey’s success. However, virtually no empirical work has examined the effects of the three levels of forced responses or the two styles of question items displayed on a web survey’s response rate. The current study attempted to fill this void. Using a quasi-experiment approach, we obtained 778 unique responses to six comparable web questionnaires of identical content. The analysis confirmed that (1) there were statistically significant differences across the surveys with the 100%- forced responses, and (2) there is not a significant difference between the response rates between surveys with scrolling and those with paging styles. In addition to extending the theoretical insight into factors contributing to a web survey’s response rate, the findings have offered recommendations to enhance the response rate in a web survey project.

Key words: Forced responses, Question display styles, Scrolling, Paging, Web survey response rate

JEL code: C80, C83, M15

Introduction

Online questionnaires are tools that social science researchers including those in business and management fields have adopted to gather data from samples through major web browsers (Lee & Yun, 2015). The increasing number of publications has addressed issues on how to implement a web survey using online questionnaires.

One of the issues is the execution of online questionnaire survey to increase a response rate. This is because a project in which a questionnaire is delivered either by mail or online is often known as having a low rate of response.

The rate is sometimes so low that the validity of the project might be in question.

Online questionnaires do have certain limitations and advantages (Reips, 2002, 2007). An online survey has two limitations that researchers must prepare a proper plan for in order to minimize prior to starting the data collection. First, an online survey always reaches only Internet users. If the project’s target population taps those whose profiles are not largely shared with Internet user profiles, researchers may have to give up the online version. Second, given the nature of the Internet, the samples’ responses may be different from those taking part in traditional paper-based questionnaires. Such responses include those from the same subject or from
unqualified samples. They could immensely distort the finding’s validity and reliability. As a result, researchers may have a set of screening questions to eliminate unqualified samples or check the IP address of the samples’ online responses. If two responses from the same IP address are given within a short period of time, researchers may have to pay close attention to all responses from that IP address (Albaum, et al., 2010). In addition to the IP check, Lee and Yun (2015) used samples recruited by a marketing research company who guaranteed the qualification of the samples. Nonetheless, compared to their offline counterpart, online questionnaires still offer three major advantages.

They include (1) a smaller margin of error in recording the collected data into a computer file since the data are saved as soon as a sample responded to the questionnaire items, (2) there are quick data analysis and data collection processes because of the Internet’s worldwide accessibility, and (3) the cost of the survey is justified on a general topic since researchers can reach a large group of the targeted population.

One quality check of a survey project is through the response rate. Typically, it is the percentage of the number of returned questionnaires to that of the distributed questionnaires. Through an online channel; however, the response rate is the proportion of the number of submitted questionnaires to the number of those who visited the questionnaire webpage (Vicente & Reis, 2010). Such measurement does suffer from a few shortcomings. First, among the submitted questionnaires are both complete and incomplete surveys. This mix also happens in the traditional paper survey. Yet, only the complete ones could indicate the samples’ determination to take part in the research project. Second, while it is easy to count those who receive paper-based questionnaires, it is fairly tricky in the online project. This is because (1) those who receive a link to an online questionnaire could have forwarded it to the others or (2) those who are not the target population may inadvertently have access to the online questionnaires. Therefore, it is difficult to count the number of online questionnaires distributed to the target sample. To address this problem, research methodology scholars suggest that a researcher use the number of visitors to the questionnaire webpage as a proxy of those who receive the surveys (Dillman, 2000; Fan & Yan, 2010). North and Park (2012) report a response rate of 30% in one leadership survey in New Zealand.

The current study is thus an attempt to use an experiment to see if any of the design or the process factors can help enhance the response rate of a web survey.

Literature Review

Vicente and Reis’ (2010) remark on how to earn a high response rate in web surveys is highly informative. Along with others, they classify two features of online questionnaires that could grab subjects’ attention and retain it through to submission. First, the task-related features are those that interact with the subjects. Examples of these features are the question’s wording, forced responses, or answer options. Second, the style features are those mainly related to the look of the questionnaires. Examples of these features are display styles, whether the questionnaires are personalized for each subjects’ demographics, or if an audio signal is embedded in a survey. The two features are in line with Jackob and Zerback’s (2006) structural and visual appearance of the web surveys, respectively. Emphasizing the importance of non-response inspection, Atinc (2012) suggested that social science researchers must be aware of their samples’ demographics since a response rate is related to those personal details which could minimize non-responses. For instance, Polonsky and Vocino (2010) discovered that based on their experiment that old and employed subjects were more likely to complete web-based questionnaires than the young or unemployed samples.

Among many attempts to examine factors affecting an online business survey completion rate, forced response and question display styles are of interest since no previous attempt has addressed them in the same study. According to Vicente and Reis (2010), the forced response is task-related and the questionnaire display style is design-related. Forced responses refer to an online survey execution through which a sample is reminded to answer a questionnaire item if he or she has missed it.

This feature is not really possible in a traditional paper-based survey. With certain programmability, it is easy to detect any missing questionnaire items and forcibly remind the sample to answer them. The sample can be prevented from proceeding to the next step unless he/she responds to the missing item. The “forced choice” style is similar to the forced response design but they are notably different. The forced choice refers to the survey design that suggests possible choices of answers to which a subject could respond. For instance, a researcher may adopt a four-level scale (e.g., least, less, more, or most), instead of a typical five-level scale (e.g., least, less, neutral (or
average), more, or most). This is how a researcher forces a subject to agree on certain choices. The forced response, however, is requires a sample to respond to a questionnaire item if it is left unanswered. The item could be a Likert scale or an open-ended question. The sample cannot proceed to the next step unless he/she responds to it.

To persuade a sample to take part in a survey with sensitive topics, Lahaut, et al. (2002) suggested that a researcher design a questionnaire such that the response is rewarding, inexpensive, and trustworthy. Even though forced responses may have been perceived as invasive, researchers may have a design that could lead to at least one of the three perceptions. For example, a survey with a seal of trustworthy sponsor could gain a trust from a subject.

Based on the experiment approach, Derouvray and Couper (2002) discovered that the forced-response condition had lower responses than did the no-forced condition. Similarly, Stieger et al (2007) conducted a survey on students’ well-being issues in Europe and confirmed that the forced-response increased the number of survey dropouts. Furthermore, male samples dropped out faster than female subjects. The poor performance empirically supports Dillman’s (2007) statement that forced-response may annoy the samples to the point that they want to discontinue the survey or even turn the web browser off. However, Albaum et al (2010) failed to offer empirical evidence that the forced answering could have lowered a completion rate. Its effect of the forced responses is thus as such still inconclusive.

How to display questionnaire items to attract samples’ attention and to further retain it until they submit the completed questionnaires to a researcher has gained remarkable attention (Crawford, et al., 2005; Fan & Yan, 2010). Presenting a table that was wide on a web-based survey led to more dropouts than a simple one (O’Neil, et al., 2003). Yan et al’s (2007) experiment verified that the presence of a progress indicator (i.e., visual feedback information to tell samples how far they had responded to the survey questionnaires) led to fewer dropouts only when the questionnaire length was perceived as short. Recently, a survey of radiologists validated that long questionnaires were not a problem as long as incentives were justified (Ziegenfuss, et al., 2013). Experimenting on different waves of survey interviews, Lynn (2014) reports no evidence that the survey length affects the quality of the interviews, although it certainly affects the survey costs.

One of the design guidelines of the question display is to choose between scrolling and paging layouts. The scrolling style displays the entire questionnaire in one single webpage. It thus requires a sample to scroll down while completing it.

The paging style displays the questionnaire in many webpages requiring the samples to “flip” to the next page or the next section. The flip could be through a click on the “next” or “continue” buttons. According to Dillman (2007), the scrolling design demands less computer resources because it requires one single submission of the questionnaire. Moreover, the samples are able to scroll back to review their responses since it appears solely on one webpage. However, the paging design allows different structures of the same questionnaire. In other words, the paging design could have outperformed the scrolling style if the response to each questionnaire item were non-linear (O’Neil, et al., 2003). For instance, the samples whose responses to the gender item are male would have to answer a different section of the questionnaire, as compared to those who replied as female to the gender item.

In a national online survey, Batagelj et al. (2002) contended that the scrolling design had higher incomplete responses than the paging design. There was a study of survey in which the difference of completion rates between the two designs were not significant, yet the scrolling design had higher omitted items than the paging layout (Tourangeau, et al., 2004). The insignificant difference was also evident in Peytchev et al’s (2006) study in which university students were main subjects. They claimed that the insignificance could have been a result of the survey design that demanded equal efforts from the student samples.

Galesic and Bosnjak (2009) claimed, furthermore, that subjects perceived a survey with the scrolling design as a long survey while viewing a survey with the paging layout as a relatively short survey. To verify the claim, Galesic and Bosnjak (2009) did an experiment using a web survey that had 180 questionnaire items asking subjects about their financial activities such case withdrawal or balance checking. The results confirmed the hypothesis in which the perceived longer the questionnaires, the less the response rate.

Given the findings from the previous research (Galesic & Bosnjak, 2009; Peytchev, et al., 2006; Tourangeau, et al., 2004), it is still inconclusive which design between scrolling and paging is better. This is perhaps why Elliot et al (2002) suggested the hybrid version combining the scrolling and paging styles. The hybrid design; however, requires a researcher’s enormous effort to
balance the number of questionnaire webpages and the amount of up-down scrolling. Das et al. (2009) remarked that a display of one questionnaire item per page could draw a sample’s attention to the survey; yet, they failed to verify their remark. In addition, a few projects were unsuccessful to substantiate similar statements (Batagelj, et al., 2002).

Research and Methodology

Research Objectives

A review of previous literature indicated two gaps for possible research. First, a large amount of research has examined the quality of a web survey. Only a few projects have empirically addressed the survey’s response rate (Galesic & Bosnjak, 2009) but their findings are inconclusive or limited only to certain groups of subjects. It is thus a call for more research on the issue. Second, there is virtually no experiment investigating the effect of varying degrees of forced responses (e.g., 100%- , 50%- or 0%- forcing) or different styles of question display (e.g., scrolling and paging) on a web survey response rate.

As a result, the current study’s objectives were to (1) compare the rate of responses to web surveys using 100%- , 50%- and 0%- forced answering conditions, and (2) compare the completion rate of web surveys with those with scrolling and paging designs of the question items.

To achieve the study’s objectives, this section describes five methodology issues. They are the research approach; experimental units; questionnaire content and experimental execution; reliability and validity issues; and data analysis framework and hypothesis statements.

Research approach

Given the study’s casual style, we strived to adopt the quasi-experimental approach. The two independent variables are (1) forced responses and (2) question display styles. The forced-response variable has three possible values. They are (a) 100%-forced responses (i.e., subjects are forced to respond to every questionnaire item), (b) 50%-forced response (i.e., subjects are forced to respond to half of all items) and (c) 0%-forced response (i.e., subjects are free to leave any questionnaire items unanswered). The selection of the 100% and 0% forced categories was challenged by previous studies (Albaum, et al., 2010; Dillman, 2007). The 50% choice of forced response was added to whether the forced response should be dichotomy and researchers may want to force the responses to only to a few items.

The question-display variable has two possible values. They are the (a) scrolling and (b) paging styles of display. Using the scrolling design, the entire questionnaire appears in one webpage. On the contrary, the paging style would display a few questionnaire items per page (the detail of questionnaire development will be in the next section).

The dependent variable is the response rate measured by dividing the number of submitted questionnaires by the number of those who visited the questionnaire webpage.

Experimental Units

Given the quasi experiment approach, the participants must not only represent the target population, but also share large compatibility such that the difference of the completion rate, if any, is due to the two independent variables, not only to the subjects’ incompatibility.

We were fortunate to receive assistance from the Stock2morrow website. They allowed us to invite their subscribers to participate in our experiment. Based on the six conditions (3 levels of forced responses x 2 styles of question display), the number of subjects per condition should be at least 30-40 (Roscoe, 1975). The Stock2morrow website administration agreed that we could post a call for research participation on the website. Within the two-month data collection, 778 unique visitors to the website took part in the experiment, of which each condition had about 128-132 experimental subjects.

Questionnaire Content and Experimental Execution

The six experimental conditions require similar questionnaires of identical content. The difference among these questionnaires is likely from the manipulation of the two independent variables. The Stock2morrow website requested that the questionnaire content help them to improve the website and perhaps their business. We therefore included in the questionnaire a total of 36 question items asking subjects about their demographics, web usage, their life style, and their reaction when they were asked to participate in an online survey. The Stock2morrow administrator agreed on the survey contents and the number of items. This represents a typical context in business and management where researchers want to use an online tool to gather data to help improve certain services.

Given the three levels of forced responses, those in the 100%-forced-response group were forced to answer all 36 items. Those in the 50% group had to answer every
other item. The subjects in the 0% group were not forced to respond to the items they may have missed.

Regarding the question display, the entire questionnaire appeared in one webpage for the scrolling style. For the paging style, the questionnaire was divided into four sections, each of which appeared on one webpage. The total number of pages for the paging style was thus four pages.

Once the six versions of questionnaires with identical content were crafted, we pretested them on twelve graduate students at Chulalongkorn Business School and made a few adjustments. When the questionnaires were ready, they were posted from June – July 2012 in messages inviting subscribers to the Stock2morrow website to respond to the questionnaires. We randomized a subject to one of the experiment’s six conditions. After the first group of six random samples had been placed in all six conditions randomly, the next subject was randomized to one of the six conditions again. We repeated this process until the number of samples in each condition exceeded the minimum threshold of 50 subjects.

After two months of data collection, all questionnaires were replied to 912 times but when duplications were removed, there were a total of 778 usable records for further analyses.

Reliability and Validity Issues

We strived to respond to the two objectives validly and reliably. Such efforts included the followings.

i. To motivate the Stock2morrow website subscribers to take part in our experiment, we explained in the call for research participation that their participation was critically important to the research community. Also, to show our appreciation toward their participation, we offered a lucky draw at the end of the project to win a mini iPad.

ii. To conform to the approach of using an experiment in social science research, we selected the condition of the scrolling style with no forced-response as the control group. This decision was because it is typically a default design available in many online questionnaire services.

iii. The pretest was deemed useful. It facilitated learning about technical incompatibility and how to prepare for it. During the pretest, we discovered a few flaws in the data we collected. They occurred when pretest samples used different browsers or worked on diverse platforms to do our questionnaires. To minimize the chance of such differences, we programmed a pop up window to suggest a set of acceptable choices for the respondents.

iv. The questionnaires were carefully crafted and thoroughly tested to ensure their effectiveness. To minimize the chance of duplicating participation, we developed a session to control the number of responses. We did not keep track of any IP address as suggested in the previous online research. Such tracking may have reduced the number of responses from those who might have shared the same computer stations and the IP address.

Data Analysis Framework and Hypothesis Statements

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Findings and Implications

The demographic profile of the experimental subjects are shown in Table 1. The highlights are as follow:

i. Most of experimental subjects are male, 36-55 years of age with at least college degrees. 26% of those who submitted questionnaires (the largest portion) earn a monthly income of 10,000-24,999 baht.

ii. We expected to have the Stock2morrow website subscribers as participants since we posted an invitation to take part in our project on the website. However, only 39% of the participants claimed they were subscribers of the site. The remaining who submitted the questionnaires indicated they were not members.
According to Tables 2 and 3, 61.6% of 778 who visited the questionnaire site provided their responses. Given three levels of the forced-response condition, the samples who responded to the 100%- forced, 50%- forced and 0%- forced responding categories were 64.2%, 55.4% and 65.1%, respectively. Regarding the scrolling and paging styles of question display, the percentages of those who responded to the questionnaires were 63.5% and 59.6%, respectively.

Table 1. Profiles of Experimental Subjects

| PROFILES              | N (%)  |
|-----------------------|--------|
| Gender (N=470)        |        |
| Male                  | 323 (69)|
| Female                | 147 (31)|
| Age (N=471)           |        |
| Less than 23 yrs      | 42 (9)  |
| 24-35                 | 184 (39)|
| 36-55                 | 210 (45)|
| At least 56 yrs       | 35 (7)  |
| Highest education (N=468) |    |
| Less than college     | 32 (7)  |
| College degrees       | 287 (61)|
| Graduate level        | 149 (32)|
| Monthly salary in Thai baht (N=463) |    |
| Less than 10,000      | 38 (8)  |
| 10,000-24,999         | 118 (26)|
| 25,000-39,999         | 99 (21) |
| 40,000-54,999         | 81 (18) |
| 55,000-69,999         | 46 (10) |
| 70,000-100,000        | 29 (6)  |
| Higher than 100,000   | 52 (11) |
| Whether a subject subscribes to the stock2morrow website (N=474) |    |
| Already a subscriber  | 184 (39)|
| Not yet a subscriber  | 290 (61)|

Source: Author

Table 2. Survey Responses Categorized by Three Levels of Forced Responses

| ISSUES                     | LEVELS OF FORCED RESPONSES | TOTAL |
|---------------------------|-----------------------------|-------|
|                           | 100%- forced               | 50%- forced | 0%- forced |
| Number of submitted questionnaires | 165                          | 144 | 170 | 479 |
| Number of visitors to the questionnaire webpage | 257                          | 260 | 261 | 778 |
| Response rate             | 64.2                        | 55.4 | 65.1 | 61.6 |

Source: Author

Table 3. Survey Responses Categorized by Two Styles of Question Display

| ISSUES                     | QUESTION DISPLAY STYLES | TOTAL |
|---------------------------|-------------------------|-------|
|                           | Scrolling               | Paging |
| Number of submitted questionnaires | 247                      | 232 | 479 |
| Number of visitors to the questionnaire webpage | 389                      | 389 | 778 |
| Response rate             | 63.5                     | 59.6 | 61.6 |

Results of the hypothesis testing are in Table 4. The differences of the response rate across the three types of forced responses are statistically significant (p-value (.041) < .05). Yet, those between two styles of questions displayed or the interaction effect of the forced responses and the question display were not significant (p-value (.264 and .329 >.05). Multiple comparisons between the different pairs of forced responses were performed. The results in Table 5 confirm the statistically significant differences of the response rates between those in the 100%- and in the 50%-forced answering and between those in the 50%- and the 0%-forced answering groups. A multiple comparison on the
question display styles or on the interaction because of the ANOVA’s insignificant results was not performed.

Results of the hypothesis testing are in Table 4. The differences of the response rate across the three types of forced responses are statistically significant (p-value (.041) < .05). Yet, those between two styles of questions displayed or the interaction effect of the forced responses and the question display were not significant (p-value (.264 and .329 >.05). Multiple comparisons Table 4. ANOVA results

| SOV                                      | df | SS   | MS   | F Values | Significance Level |
|------------------------------------------|----|------|------|----------|--------------------|
| Forced responses                         | 2  | 1.508| 0.754| 3.209    | 0.041              |
| Question display styles                   | 31 | 0.294| 0.294| 1.251    | 0.264              |
| Forced responses x Question display styles| 2  | 0.524| 0.262| 1.115    | 0.329              |
| Error                                    | 772| 181.763| 0.235|          |                    |
| Total                                    | 777| 184.089|       |          |                    |

**Source:** Author

**Table 5. Multiple Comparisons**

| COMPARING PAIRS                  | Proportion test statistics, Significance level |
|----------------------------------|-----------------------------------------------|
| 100%- vs. 50%-forced responses   | 2.04, 0.021                                    |
| 100%- vs. 0%-forced responses    | -0.22, 0.413                                   |
| 50%- vs. 0%-forced responses     | -2.27, 0.011                                   |

**Source:** Author

**Conclusions**

We have attempted to compare one web survey’s response rates across three levels of forced responses and between two styles of questionnaires displayed. Via a call for research participation posted on the Stock2morrow website, the subjects were asked to respond to one of six comparable questionnaires of identical content. Most of the subjects were men between 24-35 years of age and mostly holding at least a college degree. Yet 6 in 10 have not subscribed to the Stock2morrow website. Although the demographics appear to confirm the representative samples of Stock2morrow subscribers or those of Internet users in Thailand, it could be premature to make such a claim since only 4 in 10 of the participants are current website subscribers. Readers must therefore be cautious when using the study’s findings.

Only the differences of response rates between the two pairs of questionnaires with varying degrees of forced responses were statistically significant. The pairs are the surveys (1) with 100%- and 50%- forced responses and (2) with 50%- and 0%-forced responses. Nonetheless, the response rates between the questionnaires with 100%- and 0%-forced answering were not significant. Based on the findings, the lowest rate of web survey responses was on the 50%-forced response project while the rates on the completely-forced and the non-forced response were comparable but remarkably higher than the 50% group (see Table 2). It seems that subjects in the current experiment were willing to respond to the questionnaires that forced them to answer every single survey item (i.e., 100%-forced answering) or those that did not force an answer at all (i.e., 0%-forced answering). However, significantly fewer subjects in the half-forced answering survey were willing to submit their questionnaires. Should we consider only the 100%- and 0%-responding surveys, our finding of the comparable response rates between these two groups contradicts those in previous work (Albaum, et al., 2010; Derouvray & Couper, 2002; Yan, et al., 2007) in which the forced responding category was found as effective as the non-forced group. In addition, Stieger et al (2007) found that the dropout in the forced category was higher than that in the non-forced counterpart. Derouvray and Couper (2002) also remarked that the forced answering may attract less responses than the non-forced group. Given the limited amount of previous empirical research addressing effects of the forced replies on a response rate in a web survey, our possible explanation could be that samples in a web survey prefer either full or no restriction when it comes to responding to an online survey. It implies further that some extent of response restriction (e.g., 50%-forced response) may confuse the samples as they encounter...
the message forcing them to answer some missing survey items but no such message on the others. Such speculation is, however, highly uncertain, and empirical research is being urged to verify it.

Our attempt to validate the effect of question display styles on response rates has failed since the rates on the scrolling and the paging styles are about the same. Such trivial finding replicates results in previous studies (Norman, et al., 2001; Peytchev, et al., 2006; Sedley & Callegaro, 2012). The possible explanation could be that our questionnaire survey with the paging style consisted of only four pages, each of which did not fit in one screen. As such, the samples may have not perceived it as much different from the ones with the scrolling design. The second possible explanation of the non significant results is based on Peytchev et al.’s (2006) experiment. The trivial finding in their research was due to having a long survey. In other words, the paging style should have led samples to (1) perceive that the questionnaire was relatively short and (2) subsequently make an effort to respond to it completely. However, if the paging design does not lead to a perceived short survey (in the current study, for example, each of the four pages in the paging design was so long that the scroll bar popped up on the right edge of the screen), the samples may not be motivated to respond to the survey. In other words, if the questionnaires are perceived as being short, the sample might respond to them similarly, no matter how the layout is the scrolling or the paging styles. Such explanation, however, still needs empirical verification.

Our findings offer theoretical and practical contribution. Theoretically, our findings have extended insight into the design features of online questionnaires in the Thai context. Practically, we could offer two recommendations. First, business and management researchers who attempt to use an online channel to gather data using a questionnaire may choose to force responses only to some items is not suggested no matter how the layout is the scrolling and the paging styles. Such explanation, however, still needs empirical verification. Second, researchers may not need to choose between the scrolling and the paging style of question display when there is no significance between the two styles. However, in a project where a certain group of samples must respond to certain groups of questions, the paging style should still be a researcher’s choice (Dillman, 2007). This is because the responses to such project are non-linear. Only if all samples must answer the same set of survey items (i.e., the responses are on a linear pattern) should the scrolling style be considered.

Similar to other research, the current study has two limitations. First, we adopted the quasi experiment approach. Although external validity is acceptable, the internal validity must be inevitably compromised. Second, our conclusion is substantial only among the subscribers to the Stock2morror website. As a result, a generalization across other contexts may be made with high caution.

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