Online Survey Research: Can Response Factors Be Improved?

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ABSTRACT. The use of the Internet and online methods for data collection brings about new challenges for academic and managerial researchers. Our objective is to advance our level of knowledge regarding online data collection through an experiment. Using a local organization's e-mail list, we evaluate survey introductory elements such as 10 invitation from a known leader and introductory length. We evaluate resulting levels of response rate, response quality, and respondent satisfaction to assess the effects of modified survey introductory designs. Findings reveal that an invitation from a known leader leads to improved levels of response quality while shorter introductions result 15 in a quicker response from survey participants.

KEYWORDS. Data collection, introductory elements, online-surveys, response quality, response rate

The importance of the Internet and other online means for collecting data is perceived as a critical technological advancement in the data 20 collection field. Dillman (2000) describes the use of e-mail, Internet, and other electronic survey methods as a dramatic improvement in

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data collection efficiency. He stresses the importance of the efficiencies gained through electronic data collection as follows:

> These efficiencies include the nearly complete elimination of paper, postage, mailout, and data entry costs. Some of these electronic survey methods also provide a potential for overcoming international boundaries as significant barriers to conducting surveys. In addition, the time required for survey implementation can be reduced from weeks to days, or even hours. Most importantly, the introduction of electronic survey methodologies offers the potential for dramatically reducing the close correspondents between sample size and survey costs. (Dillman, 2000, p. 352)

Online methods for data collection are used in a variety of situations including research among the managerial community as well as the academic community. Online surveying is widespread for surveying among individual consumers (e.g., Zviran, Glezer, & Avni, 2006), business-to-business customers (Grant, Teller, & Teller, 2005), and industrial markets (McNaughton, 1999). Furthermore, online surveying is being implemented among many different marketing subdiscipline areas including services marketing (e.g., O'Cass & Fenech, 2003), retail marketing (Seiders et al., 2005), as well as other marketing areas.

Since survey research relies on data collection methods to gather pertinent information, it is critical that researchers develop a deeper understanding of data collection methods and the design factors that impact survey results. Furthermore, given the potential advantages of online data collection, the growing use of online data collection among many areas in business, and the reality of declining levels of participation within managerial and academic surveys (Baruch, 1999; Cycyota & Harrison, 2006), research involving evaluation of online data collection is warranted.

Previously, Roster et al. (2007) identified low-response rates and item omission rates as issues associated with online data collection methods. This study's focus is to examine the factors that impact data quality and survey participation when online data collection is conducted. Social exchange theory (Thibaut & Kelly, 1959) is used to further explain response quality and participation variations under experimental conditions when using online data collection for research.

LITERATURE REVIEW

In addressing the literature we first examine the issues associated with mail and online collection methods and then the use of introductory elements. After reviewing these areas, the literature that provides a framework for the current study is addressed.

Mail and Online Data Collection

Several academic research studies comparing mail and online methods of data collection have shown that online means for collecting data are superior in several ways. For example, Ilieva, Baron, & Healy (2002) conducted research using both postal and online methods for data collection. Results from their study suggest that online methods are superior in several areas including lower financial resources required, shorter response times, researcher control of sample, reduced survey involvement by the researcher, and efficiency in data entry (Ilieva et al., 2002). Additionally, Cobanoglu, Warde, & Moreo (2001) find that response rates for e-mail surveys are significantly higher than those of both fax and mail surveys. Wright, Aquilino, & Supple (1998) tested for differences in response characteristics between adolescents completing paper and pencil questionnaires with sensitive questions versus adolescents completing the same questions using laptop computers. Findings from their research reveal that adolescents were more likely to provide responses to sensitive questions and adolescents reported lower levels of mistrust when online data collection methods were used (Wright et al., 1998).

Despite the positive results of some previous research, additional research surrounding the use of online data collection has not been as positive. For example, Roster et al. (2007) found that the use of online means for data collection produced an inferior response rate, and more item omissions when compared to traditional collection methods. In addition, Roster, Rogers, & Albaum (2004) observed more neutral evaluations when compared to the use of telephone interviews. Furthermore, Roy & Berger (2005) conducted a study among managers across several countries and compared response rates between surveys conducted via postal mail and e-mail. These authors found that the mail method for data collection produce higher response rates when compared to the e-mail method (Roy & Berger, 2005). Additionally, according to Birnholtz et al. (2004),

the majority of the advantages of online survey research appear to benefit the researcher to a disproportionate level compared to the benefits to respondents. Birnholtz et al. (2004) suggested that there are many instances where respondents are overburdened by the use of online data collection while researchers reap the benefits.

Other research has shown approximately equivalent results between online-based data collection methods compared to other methods. For example, McConkey, Stevens, & Loudon's (2003) research among accounting professors revealed that online data collection proved to yield similar response rates as well as response content when compared to a mail format. Griffis, Goldsby, & Cooper (2003) conducted research in a logistics context and found that there were no concerning differences between data collection via online means and paper and pencil methods.

In light of the advantages and despite the disadvantages, the number of online-based surveys conducted among the academic and business communities appears to show a pattern of growth. Furthermore, the online capabilities and equipment available for consumers continues to rise (Dillman, 2000). This increase of technology in households provides more communication possibilities between business researchers and consumers. This online path encourages growth of electronic data collection methods even further.

Introductory Elements

Survey introductory elements have been under examination for decades. Singer & Frankel (1982) evaluated differences in response quality and response rate when survey introduction information varied. Their experiment varied survey introductory information regarding the purpose of the survey and survey task expectations. They found no differences in response quality or response rate when these factors were modified among telephone interview respondents. However, these authors emphasize that there were more occasions of item nonresponse for sensitive questions under the conditions of detailed research purposes and even though these differences were not significant, the authors encourage further examinations to confirm this finding (Singer & Frankel, 1982). In a more recent study, Andersen & Blackburn (2004) show that the use of intense language in survey introductions produces significantly higher response rates. Furthermore, a study conducted among individuals with a disease revealed

that survey introductions that detail the study's purpose can result in artificially inflated responses concerning their medical condition (Smith et al., 2006).

Current Study

This research focuses on the use of online methods for data collection and the changes in response factors when survey introductory elements are varied. Response rate (McConkey et al., 2003), response quality (Hanna et al., 2005), and respondent satisfaction (Manfreda, Batagelj, & Vehovar, 2002) are evaluated under conditions of varying survey introductory elements (Brennan, Benson, & Kearns, 2005) to determine the impact of these elements and to provide insight into the most effective means for survey introduction when conducting online-based surveys.

MEASURES

In the evaluation of any research method is it important that appropriate measures are established. We address the areas of response rate, response quality, respondent satisfaction, and introductory elements to insure that the proposed measures are established.

Response Rate

One of the most important measures to consider when evaluating research effectiveness is the level of survey participation or response rate (e.g., McConkey et al., 2003). In their examination of research involving response rates, Shaw, Bednall, & Hall (2002) found a lack of consistency for response rate despite the criticality of sampling as a building block for most social research. They also discuss the computational similarities and differences between the use of survey participation rate (Tse, 1998) and response rate (Shaw et al., 2002). Kent & Brandal (2003) argue that response rate is a complex measure, particularly in the context of e-mail survey research. This research utilizes the computation for response rate for use in e-mail survey research as presented in Kent & Brandal (2003) as follows:

$$\frac{\text{completed questionnaires returned via e-mail}}{(\text{total e-mails sent} - \text{e-mail messages returned undeliverable})}.$$

Response Quality

Response quality has been used to evaluate effectiveness across 170
multiple methods of data collection efforts for many years (e.g.,
Singer, 1978). Bush (1984) provides an excellent review of the litera-
ture and a broad perspective of the response quality construct.
Approximately two decades later, Hanna et al. (2005) provide
another meta-analytic view of the various definitions of response 175
quality. Merging these two meta-analyses of response quality, this
research utilizes the following measures to represent response quality:
1) item omissions, 2) completeness of answers, 3) response time, and
4) response speed. In addition, the issue of respondent satisfaction
can also address the issue of effectiveness.   180

Item Omissions

Item omissions, omission rate, or item nonresponse refers to
respondents' refusal to answer specific individual questions from a
survey task (Bush & Hair, 1985). This study uses the number of unan-
swered questions as the measure of item omissions. Questions where a 185
"not applicable" response was possible, such as demographics includ-
ing age of children in the household for a respondent with no chil-
dren, were excluded from the computation of item omissions.

Completeness of Answer

Completeness of answer refers to a respondent providing in-depth, 190
full, complete answers to survey questions (Bush & Hair, 1985). This
has been measured by counting the number of words or characters
for a response to one or more open-ended questions (McDaniel &
Rao, 1980). Similarly, this study computes completeness of answer
by counting the number of words in response to the most important 195
and applicable open-ended question from a brief survey to represent
levels of completeness of answer.

Response Time

Response time is the amount of time it takes for the respondent to
complete one survey response (Weible & Wallace, 1998). This 200
involves recording survey task start times and end times on a per-
respondent basis. While we did have a method for capturing response

time using online monitoring, we decided to use self-reported response time for the following reasons. First, respondents returned questionnaires in a variety of ways. While most were completed using a designated Web site, others were returned via e-mail, mail, and fax. Since online methods of collecting data were not available for these response avenues, we relied on self-reported response times. Furthermore, our monitoring method from our Web site application begins the moment the respondent opens the survey form. The monitoring system does not take into account situations where respondents might open the survey form yet delay the start of their response due to extraneous factors. For these reasons, we chose to use self-reported response times.

Response Speed

Response speed is a measure in days of the time it takes for a respondent to return a completed survey response to the appropriate party (Cobanoglu et al., 2001). We delivered an invitation to participate via e-mail on Tuesday afternoon, September 12, 2006. Since we were able to record the date each completed response was submitted, we were able to compute response speed for each completed response by simply counting the number of days between the return date and the request date.

Respondent Satisfaction

In addition to response rate and response quality measures, the issue of respondent satisfaction is also an important measure for evaluating effectiveness of survey research (Manfreda et al., 2002). As a result of their research, Manfreda et al. (2002) argue that respondent satisfaction is particularly crucial to the success of web-based surveys. This involves gathering respondents' emotional status from survey participation immediately following the main survey task. As such, we asked respondents to rate their levels of satisfaction after participating in the main survey task using a 3-item scale. More specifically, respondents were asked to indicate their level of agreement regarding feelings of satisfaction, contentment, and pleasure after their participation in the survey task.

Introductory Elements

Survey introductory elements include the communication from researchers to respondents at the beginning introduction of a survey

request (Brennan, Benson, & Kearns, 2005). This study evaluates the use of an invitation from a known leader to request survey participation among adult community members. There does not appear to be any research in the market research methodology literature that directly evaluates the effects of invitation from a person in a known leadership position.

For the purpose of this research, use of a known leader to request survey participation involves the use of the known leader's name and position title in the beginning and end of the e-mail invitation. Furthermore, wording within the request was positioned as from the specific leader individual instead of a group of people or a board.

A second introductory element is the survey introductory length (Brennan, Benson, & Kearns, 2005). This involves the length or number of words used to explain the survey request. For our purposes, we used a long survey invitation and a short survey invitation. The long version contained over twice as many words compared to the shorter survey introduction.

Lastly, this research takes an exploratory view of the use of a hyperlink versus an attached form to determine participant preferences and effects on survey response factors. Each potential participant was given the opportunity to either 1) download the questionnaire, complete the answers and e-mail their responses or 2) click a hyperlink, respond to questions online and click submit.

HYPOTHESES

Although originating from sociology, marketing scholars have brought social exchange theory (Thibaut & Kelly, 1959) into the marketing literature to help explain several aspects of business-to-business relationships (e.g., Dwyer, Schurr, & Oh, 1987). The underlying assumption of social exchange theory involves a moral obligation between the parties and the inherent reciprocity of relationship actions (Kingshott, 2006). Half of the potential respondents will receive the request for survey participation from the lead pastor of a church where they provided their contact information. Many of these potential respondents are members of the church, former visitors, or regularly attend the church. Based on social exchange theory, potential respondents may feel a sense of obligation to contribute to the relationship with the church's lead pastor,

particularly since it is likely that potential respondents attended at least one church service in the past. This sense of obligation to pay back the church for the service or services attended may lead to a greater likelihood for potential respondents to participate when the lead pastor invites them to the survey. Furthermore, respondents may feel a sense of obligation to provide thoughtful and thorough responses when a pastor specifically invites them to share their thoughts. Additionally, respondents may have stronger levels of satisfaction from survey participation if they feel that they have contributed to the relationship with the lead pastor. Hence, the following hypotheses are given:

> *Hypothesis 1a*: Survey invitation from a known leader will increase response rate for online surveys.
> *Hypothesis 1b*: Survey invitation from a known leader will improve response quality for online surveys.
> *Hypothesis 1c*: Survey invitation from a known leader will increase respondent satisfaction for online surveys.

Brennan, Benson, & Kearns (2005) tested for differences between using a short introduction versus a longer introduction to request survey participation. These scholars found that shorter introductions produced slightly higher levels of response rate, although the difference was not significant. Their research examined survey introductions in the context of telephone interviews where introductions were read to the potential respondents. This research is conducted via a text-based method (e-mail) and would therefore involve potential respondents reading the survey introduction instead of listening to a verbal introduction. From the psychology literature, Hendrick & Cunningham (2002) explain that there is strong support for the theory that describes information-processing tasks between reading and listening as nearly equivalent. Based on this theory, written long introductions are expected to impact survey response factors in the same way as Brennan, Benson, & Kearns' (2005) research using verbal long introductions.

From the communications literature, Wiksell (1946) emphasizes that verbal communication requires more attention and concentration on the part of the listener. Additionally, Wiksell (1946) argues that listening may provide more possibilities for misunderstandings

and lack of comprehension compared to reading. Therefore, it is possible that participants exposed to verbal-based survey introductions may not respond as acutely or intensely as respondents from a written survey introduction. Hence, the differences between short and long introductions for surveys using written modes should be greater than those from verbal survey modes due to this increase in comprehension for written communication.

Based on the similar requirements for processing verbal and written information (Hendrick & Cunningham, 2002) and the possibilities for increased comprehension by the reader for written communication (Wiksell, 1946), the potential respondent reading the survey introduction may respond in the same direction as Brennan, Benson, & Kearns' (2005) research; however, this response may occur with more intensity. Therefore, the following hypotheses are given:

> *Hypothesis 2a*: A shorter survey introduction will result in higher response rate for online surveys.
> *Hypothesis 2b*: A shorter survey introduction will result in improved response quality for online surveys.
> *Hypothesis 2c*: A shorter survey introduction will result in a higher level of respondent satisfaction for online surveys.

METHOD AND ANALYSES

A list of e-mail addresses from a local nonprofit organization (church) was obtained as the sample frame. These addresses include current members, individuals who regularly attend the church, visitors of the church, and other individuals from the community who provided their e-mail address to the church. Efforts were made to reach each individual on the church's e-mail list no more or no less than one time to request survey participation.

A total of 1,863 e-mail messages were sent initially. Approximately 10% of the e-mail requests were returned undeliverable for various reasons. The e-mail message requesting survey participation included all survey introductory elements. While all outgoing correspondence originated from a single e-mail address, the subject line of the e-mail and the introductory message varied. Half of the sent e-mail messages indicated that a known leader, the lead pastor, was requesting

participation in a survey in the subject line. Furthermore, the introductory letter was written from the known leader with his personal invitation to participate and his signature. The other half of the e-mail messages indicated that the organization in general was requesting participation in a survey. The introductory letter for this second half was written in more generic terms from the church. Furthermore, half of the potential respondents were given a short description of the survey's purpose while the other half were given a relatively long description with about twice as many words used to describe the research. Lastly, the e-mail message provided a hyperlink to a Web site that contained the survey form and each e-mail message contained an attached Word document of the survey instrument, which respondents could download, save and resend via e-mail. In addition, a mailing address and a fax number were also provided as options for returning completed responses. Therefore, respondents were given the option to use the attached form or to follow the provided link to the survey instrument.

Based on research by Faught, Whitten, & Green (2004), surveys conducted via e-mail receive significantly higher levels of response rate on Wednesday morning and Tuesday afternoon. Hence, all invitations were sent on Tuesday afternoon at approximately 2:00 pm.

ANALYSIS AND FINDINGS

The effective sample frame of 1,696 resulted in a total of 280 useable responses representing a response rate of approximately 16.5%. Respondent demographics reveal that the majority of respondents were married (69%). The average age reported is 39 years old with a maximum age of 71. Of those reporting gender, 29% claimed male and 71% claimed female. Average length of relationship with the church requesting participation was 5.9 years.

Response rate from the respondent group with an invitation to participate from a known leader ($n = 141$) is approximately equal to the response rate from the respondent group with a more generic invitation ($n = 139$). This lack of difference suggests that an invitation to participate in a survey from a known leader does not appear to influence participation beyond that of a more generic invitation from an organization. Thus, H1a is not supported.

Certain response quality measures appear to improve under con- 385
ditions of a leader invitation while other measures appear to remain
unchanged. Response time and response speed were very similar
between groups receiving a leader invitation versus those receiving
a generic invitation. Stated minutes for response time among respon-
dents receiving a leader invitation is 9.342 minutes while respondents 390
from a generic invitation gave an average response time of 9.337
minutes ($p = .995$). Similarly, there are no significant differences
($p = .634$) regarding response speed between leader and generic invi-
tation respondents. For the generic invitation, the average number of
item omissions is 5.35 ($n = 139$) while responses from the leader invi- 395
tation treatment group resulted in significantly lower ($p < .05$) aver-
age item omission levels of 2.77 ($n = 141$). Other measures of
response quality, such as completeness of answer, improved for the lea-
der invitation group, although the difference was not significant
($p = .501$). Therefore, our hypothesis that an invitation from a known 400
leader improves response quality (H1b) receives partial support.

Levels of respondent satisfaction measures were not significantly
different between groups receiving a generic invitation versus those
receiving an invitation from a known leader. Thus, our findings sug-
gest that the use of a leader to request survey participation does not 405
positively or negatively impact respondents' feelings toward survey
participation. Therefore, H1c is not supported.

To address H2, we evaluated differences in response levels using
t-tests where groups were divided based on long or short survey invi-
tations. Response level for the short invitation ($n = 133$) was similar 410
to the response received from the long invitation group ($n = 147$),
resulting in no significant differences in response rate ($p = .36$).
Hence, there is no support for H2a.

Regarding response quality differences, a *t*-test reveals that only
response speed revealed significant differences ($p < .05$) between 415
groups receiving short (1.76 days) and long (3.04 days) invitations.
Completeness of answer improved somewhat among responses from
the shorter invitation treatment group; however, these differences
were not significant. Other measures of response quality, including
the number of item omissions and response time, did not significantly 420
differ based on length of survey invitation. Thus, findings provide
only partial support for H2b.

Levels of respondent satisfaction appear fairly consistent across
groups. A *t*-test reveals no significant difference ($p = .46$) between

those receiving short- versus long-survey invitations. Therefore, 425
results provide no support for H2c.

We also took an exploratory examination of how factors including
age, gender, and loyalty influence response quality. For age and loy-
alty, we split respondents based on the upper 40% and the lower 40%
of the respondents for age and loyalty to the organization. While 430
there were not material differences based on length of relationship
to the organization (loyalty), significant differences exist in measures
of completeness of answer and item omissions by gender and age.
Older female respondents appear to have higher levels of complete-
ness of answer but are also more likely to skip close-ended questions 435
(item omissions) compared to younger male respondents.

Lastly, we explored the use of preferences for Internet-based
surveying, e-mail attachment survey administration, or other meth-
ods for providing completed survey forms. Given the opportunity
to respond via Internet, e-mail, mail, and fax resulted in approxi- 440
mately 70% of respondents choosing Internet as their method for
providing response. Results suggest that the use of a hyperlink for
Internet administration may produce higher levels of response.

DISCUSSION

The results of this study suggest that certain survey introductory 445
elements impact response quality but not other measures such as
response rate and respondent satisfaction. An invitation from a
known leader produced improved levels of response quality (item
omissions) compared to a more generic invitation; however, this
improvement was only present for one of the four dimensions of 450
response quality. Therefore, while the use of a known leader appears
to have some value for encouraging higher response quality, research-
ers from the managerial and academic community should evaluate
the cost of such an invitation when the appreciable benefits may only
include a reduction in item omission rates. 455

Length of survey invitation appears to impact response quality with
shorter invitations resulting in quicker responses from participants.
While respondent satisfaction and response rate did not appear to
improve from the use of shorter invitations, the improvement to this
single dimension within response quality may justify the use of shorter 460
invitations for managerial and academic research studies.

Lastly, the use of a hyperlink with an Internet-based survey tool appears to dominate other methods as the preferred method for survey participation. Hence, researchers may consider the benefits improved measures of response quality and quicker response speed when considering the possibility of using short introductory descriptions from a known leader using an Internet-based survey tool.

LIMITATIONS AND DIRECTIONS FOR FUTURE RESEARCH

The sample frame for this research involved individuals who provided their name and e-mail address to a church. Clearly, there are groups of consumers who are not represented from this sample frame, but the variety of consumers represented by this sample is adequate to begin exploration of these issues. Future studies should seek to improve the generalizability of these findings by exploring different organizations.

In addition, this study did not address the impact of gender, age, or loyalty to the organization in a comprehensive way. Clearly a larger number of females responded to the request. Due to that nature of e-mail and family affiliation with the organization, it was impossible to determine at the start which gender would be receiving the request. Furthermore, a more detailed analysis by age and loyalty is warranted to help discover the most response quality of various subgroups. Perhaps future studies utilizing a business organization could control for these factors.

Furthermore, future studies should include several other introductory elements to evaluate their importance in requesting and receiving quality survey response. Also, academics and practitioners alike could benefit from further knowledge of the possible effects of design and cosmetic factors surrounding survey instrument appearance.

CONCLUSION

This research adds to the growing body of knowledge regarding online methods for data collection. While there are limitations to this research, these findings can assist the academic and managerial communities to design survey introductions that result in higher response

rates, improved response quality, and higher levels of respondent satisfaction.

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