

# Chapter I

## E-Survey Methodology

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### ABSTRACT

*With computer network access nearly ubiquitous in much of the world, alternative means of data collection are being made available to researchers. Recent studies have explored various computer-based techniques (e.g., electronic mail and Internet surveys). However, exploitation of these techniques requires careful consideration of conceptual and methodological issues associated with their use. We identify and explore these issues by defining and developing a typology of “e-survey” techniques in organizational research. We examine the strengths, weaknesses, and threats to reliability, validity, sampling, and generalizability of these approaches. We conclude with a consideration of emerging issues of security, privacy, and ethics associated with the design and implications of e-survey methodology.*

### INTRODUCTION

For the researcher considering the use of electronic surveys, there is a rapidly growing body of literature addressing design issues and providing laundry lists of costs and benefits associated with electronic survey techniques (c.f., Lazar & Preece, 1999; Schmidt, 1997; Stanton, 1998). Perhaps the three most common reasons for choosing an e-survey over traditional paper-and-pencil approaches are (1) decreased costs, (2) faster response times, and (3) increased response rates (Lazar & Preece,

1999; Oppermann, 1995; Saris, 1991). Although research over the past 15 years has been mixed on the realization of these benefits (Kiesler & Sproull, 1986; Mehta & Sivadas, 1995; Sproull, 1986; Tse, Tse, Yin, Ting, Yi, Yee, & Hong, 1995), for the most part, researchers agree that faster response times and decreased costs are attainable benefits, while response rates differ based on variables beyond administration mode alone.

What has been lacking in this literature, until recently, is a more specific and rigorous exploration of e-survey methodology. In this chapter, we

focus on the methodological issues associated with designing and conducting e-surveys. We include additional issues relating to these methodological areas gathered from our own experience in conducting e-survey research. We begin by defining the domain of electronic surveys, and develop a typology of the various e-survey approaches that are possible with today's technology. This typology is important because methodological issues can vary depending on whether we are employing an e-mail, Web-based, or point-of-contact survey; yet these different approaches have frequently been treated synonymously in the literature (e.g., Simsek & Veiga, 2000; Stanton, 1998). We then review what we know and what we do not know about e-survey data reliability, validity, and generalizability. Finally, we consider several emerging concerns associated with designing and implementing computer-based surveys including survey security, ethical issues associated with how and when data is captured, and privacy concerns. A version of this chapter was presented at the 2000 Academy of Management Annual Meeting (Corley & Jansen, 2000).

We define an electronic survey as one in which a computer plays a major role in both the *delivery* of a survey to potential respondents and the *collection* of survey data from actual respondents. We use the term mixed-mode surveys (c.f., Schaefer & Dillman, 1998) to describe surveys that offer alternative response formats (e.g., e-mail solicitation with an option to print and return a paper-and-pencil survey).

## **A Typology of E-Surveys**

One can categorize the collection of survey data via computers into three main categories based upon the type of technology relied upon to distribute the survey and collect the data: (1) point of contact; (2) e-mail-based; and (3) Web-based. Disk by mail was once a common method (Higgins, Dimnik, & Greenwood, 1987; Witt & Bernstein, 1992), but it is used less so now.

Point-of-contact involves having the respondent fill out an e-survey on a computer provided by the researcher, either on-site or in a laboratory setting (Synodinos, Papacostas, & Okimoto, 1994), for organization members who do not use computers in their jobs (Rosenfeld, Booth-Kewley, Edwards, & Thomas, 1996). Point-of-contact surveys have also been popular among researchers wishing to have tight control over the context of the study (i.e., lab based).

The second electronic data collection technique is the e-mail-based survey. E-mail-based surveys are generally defined as survey instruments that are delivered through electronic mail applications over the Internet or corporate intranets (Kiesler & Sproull, 1986; Sproull, 1986). E-mail-based surveys are generally seen as being delivered more cheaply and faster than traditional paper-and-pencil surveys; however, they still require the researcher to manually code the data into a database after receiving completed surveys. Researchers have extensively used e-mail surveys within corporations and online user groups (Corman, 1990; Kiesler & Sproull, 1986; Mehta & Sivadas, 1995; Sproull, 1986; Thach, 1995).

The final form of electronic survey, and the technique currently receiving the most interest from researchers (e.g., Stanton, 1998; Zhang, 2000), is the Web-based survey. They are generally defined as those survey instruments that physically reside on a network server (connected to either an organization's intranet or the Internet), and that can be accessed only through a Web-browser (Green, 1995; Stanton, 1998). Because a Web-based survey is actually created through the use of a coding language, the potential exists for the survey to change based upon previously answered questions (e.g., providing a different set of questions based on reported tenure in the organization). In addition, these surveys can use animation, voice, and video to enhance the user's experience. For example, one study provided a sidebar of events that occurred in the year of the respondent's self-reported birth date to assist the

respondent with recall as well as to maintain motivation to respond to the survey (Witte, Amoroso, & Howard, 2000). Finally, Web-based surveys are often connected directly to a database where all completed survey data is categorized and stored for later analysis (Lazar & Preece, 1999; Schmidt, 1997). Web-based surveys can be either sampled or self-selected. The sampled category describes respondents who were chosen using some sampling method (i.e., randomly selected from larger population), notified of the chance to participate, and directed to the survey's Web site. In contrast, the self-selected category includes those respondents that happen across the survey in the course of their normal browsing (e.g., search results, Web advertisement, etc.) and are not proactively solicited by the researcher.

## **REVIEW OF THE LITERATURE**

A rapidly expanding body of literature on electronic survey techniques reflects a growing concern among researchers as to the methodological issues associated with their use (Couper, 2000; Dillman, 1978, 1991; Fink, 1995; Fowler, 1995; Krosnick, 1999; Sudman, Bradburn, & Schwarz, 1996). Much of this literature has focus on the methodological issues of e-surveys, or comparing Web versus other survey methods (Leece, Bhandari, Sprague, Swiontkowski, Schemitsch, Tornetta et al., 2004). These issues include the following sections.

### **Reliability**

Recent work (e.g., Davis, 1999; Richman, Kiesler, Weisband, & Drasgow, 1999) has found a strong degree of measurement equivalence between computer-based and paper-and-pencil formats, although others report lower response rate (Crawford, Couper, & Lamias, 2001). There appear to be techniques to improve response rates, however (Fowler, 1995). Data quality is also a unique

threat to e-surveys; however, recent automation tools (e.g., Jansen, 1999, 2004; Witte et al., 2000) allow for data checking.

### **Validity**

According to Cook and Campbell (1979), selection is a threat to validity when an effect may be attributed to the differences between the kinds of people in each experimental group. Instrumentation is a threat when an effect might be due to a change in the measuring instrument between pretest and posttest, rather than due to the treatment's differential effect at each time interval (Cook & Campbell, 1979). A pervasive threat is in actually changing an e-survey between time periods and administrations. The electronic development and maintenance of the survey makes it quite simple (and tempting) to make changes during the course of data collection, especially when multiple waves of data are collected over time; for example, see Zhang (2000) and Jansen (1999).

### **Sampling and Generalizability**

As with traditional survey methods, decisions regarding sampling and generalizability are important ones when considering the use of e-surveys. The interested reader can find more detailed information about specific survey methodologies in Simsek and Veiga (2000) for e-mail surveys, and Witte et al. (2000) and Kaye and Johnson (1999) for Web-based surveys.

### **Emerging Issues**

The issues of reliability, validity, and sampling and generalizability are similar to those encountered when using a traditional pencil-and-paper survey. The presence of technology does provide additional issues that must be considered in order to effectively collect survey data electronically, namely security/access, privacy, and ethics. With security, a researcher must be able to restrict ac-

cess to only those people solicited to participate. Prior research has summarized the privacy issues associated with Internet survey research (Cho & LaRose, 1999); the ethical dilemmas in how data is captured electronically and how those procedures are communicated to the respondent.

## IMPLICATIONS AND ADDITIONAL CONSIDERATIONS

A researcher must then decide which e-survey approach is best suited for the particular research project under consideration. No one e-survey type is inherently better than the others. Each approach has its benefits and drawbacks, especially when considering issues of time, money, and target population. The following section outlines the benefits and drawbacks of each approach as a way to summarize our discussion of the methodological implications of e-surveys (see Table 1).

The point-of-contact approach provides several benefits to organizational researchers. First, their use circumvents most software compatibility and

computer access problems. Second, they ensure that all respondents, regardless of computer access or position in the organization, complete the identical instrument. This approach can also afford the researcher (if the programming know-how is available) the ability to take advantage of increasingly advanced technology to provide multiple-question formats on the instrument, or to have data captured directly into a database program. The drawbacks to this approach can be consequential though, and should be taken into consideration before designing a project around point-of-contact technology. These drawbacks include the cost of supplying the equipment to the respondents, scheduling their time to interact with the equipment, the potential for time-consuming development of the instrument as well as the time-consuming task of meeting with all of the respondents, and finally, this approach may limit the number of respondents a researcher can reach in a given amount of time.

E-mail surveys provide the researcher with the ability to reach a large number of potential respondents quickly and relatively cheaply,

Table 1. Benefits and drawbacks of e-survey approaches

Approach	Benefits	Drawbacks
Web-based (both solicited and non-solicited; <i>italicized applies to non-solicited only</i> )	<ul style="list-style-type: none"> <li>• Turnaround time (quick delivery and easy return)</li> <li>• Ease of reaching large number of potential respondents</li> <li>• Can use multiple question formats</li> <li>• Data quality checking</li> <li>• Ease of ensuring confidentiality</li> <li>• Can provide customized delivery of items</li> <li>• <u>Can capture data directly in database</u></li> </ul>	<ul style="list-style-type: none"> <li>• Time-consuming development</li> <li>• Potential for limited access within target population</li> <li>• Potential for technology problems to decrease return rate</li> <li>• Security issues may threaten validity or decrease return rate</li> <li>• <i>Lack of control over sample</i></li> <li>• <i>Potential for bias in sample</i></li> </ul>
Email-based (both embedded and attached; <i>italicized applies to attached only</i> )	<ul style="list-style-type: none"> <li>• Turnaround time (quick delivery and easy return)</li> <li>• Ease of reaching large number of potential respondents</li> </ul>	<ul style="list-style-type: none"> <li>• Possibility of incompatible software</li> <li>• Potential for limited access within target population</li> <li>• Confidentiality issues may decrease return rate</li> <li>• <i>Respondents comfort level with software and attachment process</i></li> </ul>
Point of Contact	<ul style="list-style-type: none"> <li>• No software compatibility issues</li> <li>• Fewer computer access issues</li> <li>• Access to populations without computers</li> <li>• Identical instrument across all respondents</li> <li>• Technology available for multiple question formats</li> <li>• Potential to capture data directly in database</li> </ul>	<ul style="list-style-type: none"> <li>• Cost of equipment</li> <li>• Scheduling time with respondents</li> <li>• Finding acceptable location</li> <li>• Potentially time-consuming development</li> <li>• Potential for time consuming data collection effort</li> <li>• May not be able to reach large sample</li> </ul>

and to receive any completed surveys in a correspondingly short amount of time. However, as with all technology, there can be drawbacks that counter these benefits of time and money. E-mail surveys may be limited in the number of potential respondents they reach due to lack of access to a computer, to the Internet, or to an e-mail account. Issues of software compatibility must be addressed, along with the potential reliability issues present when differences in technological comfort exist among participants, especially for attached e-mail surveys. Finally, because e-mail messages usually contain some identifier of the sender, confidentiality issues may arise with e-mail surveys, serving to decrease the return rate.

Finally, Web-based surveys, while the most technologically advanced, also come with their own set of positives and negatives that must be weighed before implementation. On the benefit side, Web-based surveys are similar to e-mail-based surveys in that they provide a short turnaround time, and can reach a large number of potential respondents quickly. In addition, Web-based surveys can easily take advantage of advancing technology to provide multiple-question formats, direct database connectivity, data quality checking, customized instrument delivery, and guaranteed confidentiality, all of which can serve to improve the reliability of the data. The drawbacks can be serious, depending on the targeted population and goal of the research project, because they involve time-consuming development, limited access to potential users (only those with Internet access), potential technological problems, and the possibility of poor security threatening the validity of the study. In addition, self-selected Web surveys are likely to result in biased samples and provide little to no control over the sample.

### **Design and Planning Considerations**

Regardless of which type of e-survey is chosen, there are two additional design considerations that should be explored. First, the choice of a

particular survey methodology does not imply that solicitation and follow-up requests use the same approach. We encourage researchers to consider using mixed-mode designs, in keeping with the unique requirements of the study and the target population (c.f., Lazar & Preece, 1999; Sproull, 1986).

The second consideration focuses on different approaches for planning for, and coping with, technical malfunctions. Simsek and Veiga (2000) state that an “advantage of a WWW survey is that it is always present and available while [e-mail] is inherently episodic.” In actuality, of course, both forms of delivery suffer from the same threats (transmission errors, network availability, or network overload), while point of contact can have its own technical troubles. As a recommendation, we caution researchers to consider the possibility of their occurrence early in the survey design process, and the impact outages can have on subsequent response rates and substantive research issues. A second recommendation is that care should be taken to design user-friendly and informative error screens or instructions when the survey is unavailable. Additional fail-safes can be designed, such as providing alternate routes or means of completing the survey when it is inaccessible.

Once researchers get beyond the obvious benefits associated with using e-surveys, we must acknowledge the importance of careful design, development, and testing, which we may not be as familiar with in developing paper-and-pencil surveys. Software is now available to help create HTML forms (Birnbaum, 2000), and many firms are emerging that specialize in the design and development of electronic surveys. Some of these alternatives may be quite costly, and care must be taken that the survey and database design represent the researcher’s desires. However, if used appropriately, these services can help to offset the time and knowledge requirements associated with effectively designing and implementing a computer-based survey.

## CONCLUSION

Researchers attempting to take advantage of organizations reaching the point where computers and Internet access are common, and organizational members are comfortable interacting with electronic media, are beginning to use computer-based surveys as a way to reach large numbers of respondents quickly and inexpensively. However, the design and implementation of e-surveys involves unique methodological issues that researchers must consider. We have addressed the various electronic techniques, and clarified their methodological implications in the hope that the changing technologies faced by researchers do not result in a growing suspicion of e-survey data, but instead serve to raise the standards of what we consider to be a strong survey methodology.

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## **KEY TERMS**

**Electronic Survey:** survey in which a computer plays a major role in both the *delivery* of a survey to potential respondents and the *collection* of survey data from actual respondents.

**E-Mail-Based Surveys:** survey instruments that are delivered through electronic mail applications over the Internet or corporate intranets.

**Mixed-Mode Surveys:** surveys that offer alternative response formats (e.g., e-mail solicitation with an option to print and return a paper-and-pencil survey).

**Point-of-Contact Survey:** having the respondent fill out an e-survey on a computer provided by the researcher, either on-site or in a laboratory setting.

**Web-Based Survey:** survey instruments that physically reside on a network server (connected to either an organization's intranet or the Internet) and that can be accessed only through a Web browser.