International Journal of Internet Science
2007, 2 (1), 45-58

International Journal of Internet Science

IJIS.NET

Test of a Web and Paper Employee Satisfaction Survey: Comparison of Respondents and Non-Respondents

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Abstract: This study examined if administering an employee satisfaction survey using the Internet affected the rates or quality of employees' participation. 644 hospital employees were randomly assigned to complete a satisfaction survey using either a Web survey or a traditional paper measure. Response rates were relatively high across both modes. No evidence for a very large difference in response rates was detected. A plurality of respondents showed no preference for survey mode while the remainder tended to express a preference for the mode they had been randomly assigned to complete in this study. Respondents did not differ from non-respondents by sex, race, or education. Other response differences (such as age and employment status) are likely to be a function of the survey topic. Overall, Web and mail respondents did not differ in the level of employee satisfaction reported, the primary outcome being measured.

Keywords: Nonresponse, employee satisfaction, questionnaire design, mail and Web surveys

Introduction

The potential of the Internet as an instrument of social research remains largely unknown. To further their mission of answering important questions in a cost-effective and methodologically sound approach, social scientists have begun to examine the Web option closely.

To achieve a methodologically sound approach requires accounting for all potential methodological biases. Survey modes can influence how people respond (de Vaus, 2002; Dillman, 2000). Dillman (2000) contends that mode affects responses via normative (e.g., social desirability, acquiescence, and question-order) and cognitive (e.g., similarity of stimuli, layout and format, via different modes) mechanisms. Others also point to the cognitive burden or amount of thinking required as another cognitive-based mode effect (Tourangeau, Rips, & Rasinski, 2000). Web surveys may be especially susceptible to this latter mode effect, so careful precautions in Web design must be taken (Crawford, Couper, & Lamias, 2001). Numerous studies have pinpointed the precise mode effects comparing mail with telephone or interview methods (e.g., Dillman, Sangster, Tarnai, & Rockwood, 1996). Yet, only a limited number of studies compare mode effects between paper and Web surveys.

Press Ganey Associates provided financial support (computers, software, and technical support) for this research. The firm was not involved in the analysis, interpretation of the data, preparation, review, or approval of the manuscript. Two of the authors (Drain and Gesell) did not and will not receive any financial benefit or changes in employment contract related to this paper. The authors thank Eric Myers, Deirdre Mylod, Brian Pletcher, and Mickey Standiford for their contributions to this study. Direct all correspondence to Maxwell Drain, Press Ganey Associates, 404 Columbia Place, South Bend, Indiana 46601, USA. E-mail: mdrain@pressganey.com.

Studies examining the comparability of mail and Web surveys by looking for mode effects can be categorized by the two fundamental research question they address (Groves, 1989; Lozar Manfreda & Vehovar, 2002):

(1) Does a Web mode produce the same results as a mail mode, given the differences inherent to each mode?
(2) What is the effect of the Web mode when all other aspects of the survey design are held constant in the mail mode?

The first of these research questions is easier to test and, as a result, has been examined more often. Vehovar, Batagelj, Lozar Manfreda, and Zaletel (2002), in a survey of companies and schools, concluded that respondents prefer mail surveys based on the higher completion rate (54% vs. 26%) and found Web surveys with mail solicitations to produce comparable results to mail-out-mail-back surveys. Also for longer surveys, the researchers think Web with mail solicitation potentially creates smaller survey error in comparison to mail-mail at same fixed costs. Carini, Hayek, Kuh, Kennedy, and Ouimet (2003) surveyed college students (86% of whom used the Internet in the past year) to test mode effects and found that, controlling for respondent characteristics, those responding via the Web survey gave significantly more favorable ratings to questions from the National Survey of Student Engagement (NSSE) than those responding via mail. Grandcolas, Rettie, and Marusenko (2003) began with a review comparing Web surveys to other modes only to find that virtually all limited their analyses to response rates and response quality, and did not establish rigorous controls to test for mode effects. Their study tested near-identical Web and mail surveys for mode effect but, instead, found differences attributable to sample bias, rather than mode--reemphasizing the need for more stringent controls and sampling. In their review, Lozar Manfreda, Batagelj, and Vehovar (2002) found that random and quasi-experimental designs have each found both comparable and only partially comparable results between modes. Reviews by Grandcolas et al. (2003), Lozar Manfreda and Vehovar. (2002), Vehovar, Batagelj, Lozar Manfreda, and Zaletel (2002) all conclude that the research remains limited and demands additional investigations.

Practical considerations, such as budgetary constraints, tend to drive a company's desire for high response rates to employee surveys. Previous research comparing response rates for mail and Web surveys has yielded mixed results. Lozar Manfreda and Vehovar (2002) found a lower response rate for Web surveys. Out of the 12 studies in the review by Grandcolas et al. (2003), 5 studies reported a higher response rate for the mail survey, 3 studies reported higher response rates for the Web survey, and 4 studies reported no appreciable difference. A review of Web surveys over 15 years finds response rates in broad decline (Sheehan, 2001). In all the studies, response rates for the Web survey varied between 6% and 73%.

This paper set out to determine whether the Web mode of administration in and of itself produces differences in respondents and non-respondents after controlling all survey design and sampling characteristics so that only the mode of communication varied between two groups. Given the design of the study, any differences in who responds to the Web survey compared to the paper survey and how they respond can be attributed to the effect that the computer has on respondents' thoughts, feelings, and behaviors. Lozar Manfreda and Vehovar (2002) identified three specific aspects of the computer context that might introduce mode effects:

(1) The presence of the computer. The mere presence of a computer can have a negative effect on less experienced computer users because of their limited *ability* to answer a survey on a computer screen using a mouse and keyboard. Computer anxiety can reduce a person's intention to complete an online survey. Furthermore, the presence of the computer may convey either a heightened or reduced level of privacy and confidentiality.
(2) The task of completing a Web survey. Working online, respondents might multi-task between answering the survey and responding to e-mail or browsing the Internet. If respondents are less focused they will likely produce less thoughtful responses. Evidence that Web text is read more quickly and less thoroughly than printed text further suggests that survey questions may be given less attention online than on paper.
(3) Survey completion as a form of social interaction. It is often thought that Web surveys yield reduced social desirability bias than mail surveys because the conventional norms of social behavior and self-presentation are reduced if not entirely absent. However the opposite has been shown: the perceived anonymity in Web surveys may lead to reduced data reliability if respondent motivation is low or the respondent likes to play with different identities. Furthermore, because anonymity is not guaranteed respondents concerned with maintaining privacy on the Web may respond with more socially desirable responses.

Purpose

Using a controlled experimental research design, we compared response patterns to paper and Web versions of an employee satisfaction survey. This paper tests the hypothesis that respondents' answers to Web surveys are

comparable to respondents' answers to traditional mail surveys. Specifically, this investigation examined the following research questions (RQ):

RQ1: Do overall response rates differ by mode?

RQ2: Which mode do respondents prefer?

RQ3: Are certain types of employees more likely to respond to either mode?

RQ4: When differences in response rates occurred, are those groups more likely to respond more satisfied than those less likely to respond?

RQ5: Do respondents give false demographic information to hide their identity? Are there differences in rates of deception by mode?

Method

Sample

The 664 employees at one rural non-teaching hospital in the US were included in the study. The sample does not include physicians or security personnel, who are contracted services rather than employees of the participating hospital.

Materials

Employees received all information concerning the study at one time. They received a personalized cover letter explaining the project and materials necessary for their participation.

Cover Letter. The cover letter, signed by the hospital president, informed employees that their opinions were very important to him, the Board of Directors, and the management team. It stated that the hospital's success depended on the administration's ability to keep employees satisfied so that they remained focused on providing excellent service to their patients. Therefore, responses to the survey would be used to evaluate progress and identify new areas for improvement. The cover letter explained, "All responses are confidential. Press Ganey collects the responses and compiles the results. No one at [the hospital's name] will ever see individual employee scores. No one at [the hospital's name] will know how you answered the questions or whether you even completed the survey." The cover letter also included a request for honest feedback. Finally, the letter explained that employees had been randomly assigned to complete either a paper survey or a Web survey.

Instrument. The Press Ganey Employee Satisfaction Survey was used to collect employee demographic and satisfaction data. The survey was developed to capture hospital employees' work experiences and to provide useful data for hospitals' performance improvement programs. The standardized survey consisted of 51 items: 9 items asking for demographic information, 41 items measuring employees' satisfaction with their current employment situation, and 1 item concerning survey mode preference (paper or online). The survey questions were arranged in 7 subscales, each representing a central dimension of employment satisfaction (work environment, job characteristics, policies and procedures, supervisor's management style, communication loop, compensation and benefits, employees' commitment to the organization). Open-ended questions asking for comments about good or bad experiences were interspersed between each subscale. According to the Flesch-Kincaid Index, which is based on the average number of syllables per word and words per question, the questionnaire has an 8th grade reading level.

The survey's reliability and validity surpass accepted standards for sound scale construction and are briefly described here (for a detailed psychometric analysis of the instrument see Press Ganey Associates, 2001). Cronbach's alpha for the entire instrument was .97. Construct validity was established through principal components analysis (PCA) with oblique rotation. The PCA produced seven interpretable factors, which accounted for 63% of the total variance in employee responses. These factors paralleled the structure of subscales on the survey. Predictive validity was established with multiple regression analysis revealing that the scale predicts the likelihood of employees' recommending the facility as a place to work, $F(40, 42917) = 2795.7$, $p < .001$, $R^2 = .72$ (*Adjusted* $R^2 = .72$). In other words, the instrument explains approximately 72% of the variation in the likelihood of employees encouraging friends to apply for work at the same hospital.

The same instrument was presented in both paper and Web-based formats. The similarities between the Web and paper survey were extensive:

(1) Question wording, question ordering, response framework, and layout were identical for both modes (with slight differences in respondent instructions at the beginning of the survey and the wording of the mode preference item at the end of the survey). All items were presented at one time so respondents could answer questions in any order in both modes. Thus, error due to the survey instrument was controlled.
(2) Both modes were self-administered and subsequently both lack the advantages and disadvantages of having an interviewer present (e.g., trained interviewers can probe incomplete responses and explain unclear terminology but also tend to increase social desirability and acquiescence response biases).
(3) In both modes, the Likert scale was presented visually. Thus, both conditions were subject to primacy effects if response order effects occurred due to respondent ability or motivation being low (Krosnick, 1999). All items were presented at one time so respondents could determine how long the survey was at any time in both modes.
(4) Although the Web can be used to present information using advanced visual and auditory modalities that mail surveys cannot offer (e.g., multiple colors, sound, animation, skip patterns progress indicators, drop down menus), such features were not included in the Web survey. The appearance of both surveys was intentionally the same. Both modes used the same hospital logo, the same black font, white background and gray shading. Hence, any differences in respondents' answers cannot be attributed to the richer channel capacity of the Web in this study (Lozar Manfreda & Vehovar, 2002).

The paper and Web-based instruments differed in only four minor ways. First, instructions were modified for each format. The paper survey instructed respondents to "circle the number" that best described their experience and to mail the survey in the enclosed envelope when they were finished. The Web survey instructed respondents to "check the box" that best described their experience, informed them that they could erase their answers by re-clicking on a checked box, and to click the "Submit" button at the bottom of the page when they were finished. Second, the Web survey recorded responses using check boxes that allowed respondents to change their answers or leave items blank as they could on the paper survey; however, they could not provide more than one response to any question. Although instructed to mark one answer, respondents using the paper survey could have marked more than one answer. If a respondent marked a paper survey with multiple answers to the same question, the least favorable score would have been analyzed. Third, the instruments differed with regard to the wording of the single item concerning mode preferences in order to be consistent with the respondents' experiences. And fourthly, unlike the paper survey respondents, Web survey respondents had to type in a Web address and a PIN before responding to the survey. These methods are consistent with the design principles set forth by Couper, Traugott, and Lamias (2001).

Procedure

All materials were distributed via the intra-hospital mail system so employees received them at their work address. Employees were randomly assigned to two conditions. Half of the sample (n = 332) received a paper survey and a postage-paid business reply envelope addressed to the research firm so that they could return the survey at no cost. The other half of the sample (n = 332) received an invitation to complete the survey online, a Web address, and a PIN. Employees were given 14 days to complete the survey. The research firm received and analyzed all surveys at a facility in a different state than the hospital. There was no follow-up contact with hospital employees.

Several steps were taken to guard against typical problems of Web surveys:
(1) All participants were randomly assigned to one of two experimental groups of equal size.
(2) All participants were given access to a computer kiosk at the hospital in case they did not have access to a computer at work or home, thus, we did not have a problematic sampling frame.
(3) We guarded against respondents answering the Web survey more than once by assigning a unique PIN to each eligible participant.
(4) Technical support was made available to participants assigned to the Web survey condition. Employees were given the names and numbers of several people in the hospital's Human Resource (HR) and Information Technology (IT) departments to contact if they needed assistance.
(5) Participants comprised a known population. Demographic information for both respondents and non-respondents was sent to the research firm by the participating hospital in electronic format so that patterns of non-response could be examined. Typically it is problematic to acquire demographic information on non-respondents. However, for this study, the hospital's HR department sent the following information for each employee: age, work address, number of years worked at the hospital, status (3: full-time, part-time, casual/PRN), shift (3: day, evening, night), role (2: supervisory, non-supervisory), position (7: registered nurse, licensed or certified ancillary professional, all other clinical services, business office clerical, all other

fiscal/administrative services, skilled maintenance, all other support services), highest level of education (5: less than high school diploma, high school diploma, graduate from trade school, graduate from college, post graduate work), sex (2: male, female), race (5: Asian, Black/African-American, Hispanic/Latino, Native American/Alaskan Native, White/Caucasian). A unique employee number identified each employee. The same demographic information was collected on the questionnaire. Thus, the survey used in this study did not provide a higher sense of anonymity than would a typical employee survey. Employees were not told that the hospital had provided the research firm with demographic information on each employee. Nevertheless, some employees might have surmised from the personalized information packets sent by Press Ganey that the hospital had provided at least their names to the research firm.

Taken together, these steps controlled coverage error, sampling error, and error due to respondents.

In order to link completed surveys to the employer-provided demographic information, the research firm generated a unique and visible code for each paper survey. That code was tied to a specific survey recipient in the firm's databases. When a completed survey was returned, the code was recognized by an automated scanning process, which linked the survey back to that specific survey recipient's record of demographic information. Records that did not have a completed survey associated with them were identified as non-respondents. For each Web survey the research firm generated a unique code that was encoded to the unique PINs employees used to access the Web survey. This step was taken to ensure that employees could not enter a PIN sequential to the one they had been assigned and complete a second survey. The processes used to collect, link, and transfer data for this study are the same ones the research firm uses to adhere to the federally mandated national standards to protect the privacy of personal health information.

Completed surveys were not made available to the hospital in either hard copy or electronic format. The firm provided the hospital with aggregated results (e.g., means, standard deviations, and frequency distributions; correlations; percentile rankings as compared to other US hospitals) in the form of a management report that highlighted strengths, weakness, and opportunities for improvement to use in its internal quality improvement efforts. The firm did not release the responses of individual employees. Minimum sample size was set at 6 for segmenting the data into subgroups. Only means were broken out by employee position (administrative services, nurses, skilled maintenance, etc.). Position was never cross-referenced with any demographic variable to provide more narrowly defined subgroups, such as "Hispanic Nurses".

A comment report containing all comments written by employees was also provided to the hospital. Comments were organized by employee position without any information that would have identified the employee even when the employee had voluntarily provided name and telephone number on the survey. Using the aggregated quantitative report and the verbatim comment report it was impossible for hospital management to identify which employees had participated in the survey and how individuals had responded.

Results & Discussion

RQ1: Do Response Rates Differ By Mode?

Previous research comparing response rates for Web and mail surveys has been inconclusive. Analysis of the current data failed to show a difference in overall response rates as a function of the survey mode (paper or Web-based). A total of 214 of the 332 paper surveys distributed (64%) were completed and returned; whereas 187 of the 332 Web surveys (56%) were completed and returned. This difference was not statistically significant ($\chi^2(1, N = 401) = 1.55, p = .21$); however a post-hoc examination of statistical power revealed that this result should be interpreted with caution. Given an expected 60% response rate, the study would need to be extended to include an additional 1335 participants to be able to adequately ($1-\beta = 0.80$) examine this question. So, although no difference was detected, power to detect a real difference was low.

RQ2: Which Survey Mode Do Employees Prefer?

Although some survey firms are being required by client hospitals to administer their annual employee satisfaction survey over the Internet, it was unknown whether employees had a distinct preference for one survey mode over another. When asked how they would have preferred to have been able to complete the survey, 30% of respondents expressed preference for a paper survey, 31% showed preference for a Web survey, and 39% said they didn't care. These groups did not differ statistically, $\chi^2(2, N = 365) = 5.13, p = .08$. Collapsing across conditions, respondents are equally distributed among preferring online surveys, paper surveys, and not caring about survey mode.

Analyses revealed an interaction effect between actual survey mode and survey mode preference, ($\chi^2(2, N = 365) = 35.94$, $p < .001$). People who received the Web survey showed preference for Web surveys, whereas people who completed the paper survey showed preference for paper surveys. Hence, respondents showed a preference for the survey mode that was randomly assigned and, at the time of questioning, was familiar and salient.

Table 1
Characteristics of Recipients of the Online Survey

Variables	Respondents (*n*)	Non-Respondents (*n*)	χ^2
Sex			.07
Male	16% (24)	17% (24)	
Female	84% (158)	83% (121)	
Education			7.12*
High school diploma or less	28% (46)	30% (38)	
Graduate from trade school	22% (36)	34% (42)	
Graduate from college	50% (83)	36% (45)	
Race			.07
White/Caucasian	93% (173)	92% (133)	
Non-White/Caucasian	8% (14)	8% (12)	
Shift			.09
Day	73% (135)	72% (105)	
Evening	16% (29)	17% (24)	
Night	12% (22)	11% (16)	
Status			50.6***
Full-time	84% (157)	51% (74)	
Part-time	9% (17)	13% (19)	
Casual/PRN	7% (12)	36% (52)	
Position			13.34**
Registered nurse	26% (48)	18% (27)	
All other clinical services[a]	33% (62)	48% (69)	
Fiscal/administrative services[b]	18% (34)	8% (11)	
Support services [c]	23% (42)	26% (38)	
Role			7.94**
Supervisory	10% (18)	2% (3)	
Non-supervisory	90% (168)	98% (142)	
Years worked at hospital (*SD*)	*M* = 6.7 (*SD* = 7.3)	*M* = 4.3 (*SD* = 5.7)	3.32***
Age in years (*SD*)	*M* = 38.1 (*SD* = 11.1)	*M* = 35.8 (*SD* = 13.2)	1.68

Note. Percentages do not always round to 100 due to rounding.
[a]e.g., x-ray technician, physical therapist, respiratory therapist, etc. [b]e.g., business office, human resources, medical records, information systems, etc. [c]e.g., skilled maintenance, food service, housekeeping, etc.
*$p < .05$. **$p \leq .01$. ***$p < .001$.

RQ3: Are Certain Types of Employees More Likely Than Others to Respond to Either Mode?

We were interested in determining whether there was a profile of employees who were more likely than others to respond to the Web survey, and respectively to the paper survey. By comparing response rates of categories of employees we determined which types of employees were over- or under represented in the Web survey and the paper survey. A number of response options on the education, race, and position variables were blank and therefore collapsed for analysis. Analyses showed no difference between respondents and non-respondents of the Web survey in terms of sex, race, shift or years worked (Table 1). Respondents and non-respondents of the paper survey did not differ in terms of sex, race, shift, education or position (Table 2).

As Internet access and understanding becomes more universal, traditionally large differences between respondents and non-respondents to a Web survey will decrease over time (Couper, 2000). The most recent studies comparing mail to Web surveys bear this prediction out, showing only minor distinctions in respondents and non-respondents (Carini et al., 2003; Grandcolas et al., 2003). In the Web survey, respondents and non-respondents did differ on 5 of the 9 demographics: education, employment status, position, supervisory role, and

number of years employed by the hospital (Table 1). Employees with college educations were more likely to respond than those with high school or trade school degrees, full-time employees were more likely to respond than part-time or casual employees, employees in fiscal/administrative positions were more likely to respond, supervisors were more likely to respond than non-supervisors, and employees who had worked at the organization longer were more likely to respond.

Table 2
Characteristics of Recipients of the Paper Survey

Variables	Respondents (*n*)	Non-Respondents (*n*)	χ^2
Sex			2.08
Male	15% (32)	21% (25)	
Female	85% (182)	79% (93)	
Education			.20
High school diploma or less	29% (57)	31% (32)	
Graduate from trade school	24% (46)	24% (24)	
Graduate from college	47% (93)	45% (46)	
Race			.45
White/Caucasian	91% (195)	93% (110)	
Non-White/Caucasian	9% (19)	7% (8)	
Shift			2.63
Day	72% (153)	72% (85)	
Evening	17% (36)	21% (25)	
Night	12% (25)	7% (8)	
Status			22.02***
Full-time	77% (164)	55% (65)	
Part-time	13% (28)	15% (18)	
Casual/PRN	10% (22)	30% (35)	
Position			6.24
Registered nurse	25% (53)	22% (26)	
All other clinical services[a]	32% (68)	38% (45)	
Fiscal/administrative services[b]	21% (44)	11% (13)	
Support services [c]	23% (49)	29% (34)	
Role			7.65**
Supervisory	13% (27)	3% (4)	
Non-supervisory	87% (187)	97% (114)	
Years worked at hospital (*SD*)	*M* = 7.3 (*SD* = 7.6)	*M* = 4.5 (*SD* = 5.9)	3.76***
Age in years (*SD*)	*M* = 39.2 (*SD* = 11.7)	*M* = 35.5 (*SD* = 12.6)	2.71**

Note. Percentages do not always sum up to 100 due to rounding.
[a]e.g., x-ray technician, physical therapist, respiratory therapist, etc. [b]e.g., business office, human resources, medical records, information systems, etc. [c]e.g., skilled maintenance, food service, housekeeping, etc.
*$p < .05$. **$p \leq .01$. ***$p < .001$.

As was done for the Web survey, we compared the characteristics of the respondents and non-respondents to the paper survey (Table 2). The pattern of responses was similar: full-time employees were more likely to respond than part-time or casual employees, supervisors were more likely to respond than non-supervisors, employees who had worked at the hospital for longer time periods were more likely to respond, and older employees were more likely to respond.

Thus, in both survey modes, respondents tended to be full-time employees in supervisory positions who have worked at the organization for an average of 7 years. The survey topic, employee satisfaction, is likely responsible for these response patterns. People tend to respond to surveys that they are more interested in and when they have a greater stake in the results. Full-time employees, supervisors, and older employees have a greater investment in the workplace than part-time/casual employees, non-supervisors and younger workers. The fact that certain "types" of individuals were more likely to respond than others leads to the question of whether response bias existed.

RQ4: When Differences in Response Rates Occurred, are Those Groups More Likely to Respond More Satisfied Than Those Less Likely to Respond?

Differences in response rates between certain groups can result in some groups being over- represented or under-represented among the respondents if two conditions are met: (1) the ratings differ by type of respondent and (2) the under-represented groups comprise a sizable proportion of the respondents. The possibility then exists that ratings given by the individuals who responded to the survey are different than the ratings that would have been obtained had everyone responded. To evaluate the presence of response bias, we examined the overall satisfaction score (composite score) by type of employee in each the online and paper study. A series of ANOVAs revealed that overall satisfaction ratings were not statistically different among categories of education, employment status, position, supervisory role, years worked at the organization or age (Table 3), the demographic variables within which different response rates had been detected in analysis of RQ3. There is no evidence showing that the overall score is not an accurate reflection of the whole population in both modes.

Table 3
Significance Tests of Overall Satisfaction by Employee Type

	Online			Paper		
Variables	*df*	*F*	*p*	*df*	*F*	*p*
Education	2, 162	2.16	0.12	2, 193	2.88	0.06
Status	2, 183	1.27	0.28	2, 211	1.62	0.20
Position	3, 182	1.60	0.19	3, 210	1.56	0.20
Role	1, 184	0.42	0.52	1, 212	2.37	0.13
Years at organization	3, 210	0.26	0.85	3, 210	0.26	0.85
Age	4, 182	0.14	0.97	4, 209	1.77	0.14

RQ5: Do Respondents Give False Demographic Information to Hide Their Identity? Are There Differences in Rates of Deception by Mode?

Given the perceived personal risk involved in criticizing one's employer on an employee satisfaction survey, we were particularly interested in determining whether respondents felt compelled to hide their identity before returning a completed survey. There were two ways respondents could have concealed their identity: (1) by refusing to provide demographic information or (2) by giving false demographic information.

Deception by Refusing to Provide Demographic Information. For every demographic item, the percentage of respondents that did not answer that item was calculated. The average item non-response for demographic items was 2% in the paper survey and 5% in the Web survey. This difference was not statistically significant, $t(8) = -1.47$, $p = .18$. Item non-response for demographic items was both comparable across survey modes and low. If employees were indeed trying to hide their identity by not providing demographic information, one would expect to see more missing data than we actually found. Thus, employees did not hide their identity by refusing demographic information in either survey mode.

Deception by Providing False Demographic Information. For every demographic item, the percentage of respondents that provided answers that corresponded to the information provided by the hospital's HR department was computed. Information was considered accurate if employee-provided and employer-provided information matched exactly. Averaging across the demographic items, 81% of respondents gave accurate information in the paper survey and 82% of respondents gave accurate information in the Web survey. This difference was not significantly different between the survey modes, $t(9) = -1.70$, $p = .13$.

Using such strict criteria to define accurate information, approximately 20% of respondents gave demographic information that did not correspond to the information provided by their employer. On closer examination it became apparent that most of the discrepancies between employee- and employer-provided information could be explained as something other than intentional deception (e.g., estimation bias, recall error, social desirability). Two items showed the greatest amount of discordance: number of years worked at the hospital and number of years of education. It was evident many employees were counting the year in progress, whereas the hospital provided the number of complete years employed. Differences seen regarding years of education reported could possibly be explained as inaccuracy of hospital records due to continued education obtained while working. It may also be a result of a desire of employees to look more educated than they were. Taken together, it does not appear that respondents tried to hide their identity in either mode by giving false information but instead gave truthful responses to questions asking for demographic information. Participants did not know that we had the

ability to compare employee-provided demographic information to employer-provided information. Thus, respondents were under no unusual social pressures to be honest about their identity. Yet, they clearly chose to be honest.

General Discussion

To date, few other studies have produced as tightly controlled sample or research designs for studying mode effects between mail and Web surveys. Relatively high response rates for mail and Web surveys yielded no significant statistical differences, although power to detect a difference was low. A plurality of respondents didn't have a preference for survey mode while the remainder tended to express a preference for whichever survey mode they were randomly assigned. Respondents and non-respondents did not differ by sex, race or shift. This is valid for both modes. Other differences in respondents versus non-respondents (such as number of years worked and employment status) appear to be a function of the survey topic. Employee satisfaction, the primary outcome being measured, did not demonstrate any statistical significance between Web and mail respondents. Taken together, these results indicate a great acceptance of Internet technologies among the population studied. We suggest that mode effects among Web surveys result from cognitive or design features of the instrument, rather than characteristics inherent in the Internet as a communication medium.

Limitations

The greatest limitation of this study is that the sample is too small to detect differences in response rates of a medium or small size. Moreover, it is selected from a single organization. The main barrier to finding hospitals willing to participate was their understandable concern to keep employee demographic information confidential. The research firm covered all expenses involved in data collection, processing and reporting, which prompted 10 hospitals (with approximately 21,000 employees) to initially agree to participate in the study. The requirement for participation that each test site provide demographic information on its employees, however, then compelled 9 of the 10 organizations to withdraw from the study. To counter a common problem in Web surveys, technical support was made available to respondents. Employees were given the names and numbers of several people in the hospital's HR and IT departments for assistance. Nonetheless, it would have been preferable if the research firm could have provided the technical assistance. Employees who wished to conceal the fact that they were participating in the survey would not have used this form of assistance.

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Appendix

Sample Survey

CLIENT LOGO

EMPLOYEE PERSPECTIVE SURVEY

Directions: **DO NOT WRITE YOUR NAME ON THE SURVEY.** Please use blue or black ink. For each statement, fill in the circle that best represents your feelings. If a question does not apply to you, please leave it blank. Make your marks inside the circles and avoid stray marks. **Thank you.**

What is your work group number? ☐☐☐☐

Please use black or blue ink to fill in the circle completely.
Example: ●

SENIOR LEADERSHIP	Strongly Agree	Tend to Agree	Tend to Disagree	Strongly Disagree
Please rate the Senior Leadership at your organization.				
Senior Leadership promotes high quality patient care	○	○	○	○
Senior Leadership does a good job of communicating major developments	○	○	○	○
Senior Leadership is aware of the major concerns of employees	○	○	○	○
Senior Leadership really listens to employees	○	○	○	○
Senior Leadership responds promptly to most problems	○	○	○	○
Senior Leadership is doing a good job of planning for the future	○	○	○	○
Senior Leadership can be trusted to be straightforward and honest	○	○	○	○
Senior Leadership's actions reflect our mission and values	○	○	○	○

JOB SECURITY	Strongly Agree	Tend to Agree	Tend to Disagree	Strongly Disagree
This organization does its best to provide job security for employees	○	○	○	○
As long as I perform well, this organization will try to find a place for me	○	○	○	○
Job security is as good or better than at other healthcare organizations	○	○	○	○

PAY & BENEFITS	Strongly Agree	Tend to Agree	Tend to Disagree	Strongly Disagree
Overall, I am satisfied with my pay	○	○	○	○
Compared to **other healthcare organizations,** my pay is fair	○	○	○	○
Compared to **other people with jobs like mine in this organization,** my pay is fair	○	○	○	○
I understand our benefits program	○	○	○	○
Our benefits program fits my needs	○	○	○	○
The benefits here are good	○	○	○	○

continued...

PARTICIPATION	Strongly Agree	Tend to Agree	Tend to Disagree	Strongly Disagree
My work group is asked for opinions before decisions are made	○	○	○	○
I have opportunities to influence policies and decisions that affect my work	○	○	○	○
I am satisfied with my involvement in decision-making	○	○	○	○

RECOGNITION	Strongly Agree	Tend to Agree	Tend to Disagree	Strongly Disagree
Excellent performance is recognized here	○	○	○	○
Promotions are handled fairly here	○	○	○	○
The current performance review system is fair	○	○	○	○
I am satisfied with how my supervisor conducts my performance review	○	○	○	○
My last performance review helped me improve my performance	○	○	○	○
My performance reviews are usually done on time	○	○	○	○

SUPERVISOR	Strongly Agree	Tend to Agree	Tend to Disagree	Strongly Disagree
Please rate the person you report to on a day-to-day basis.				
My supervisor sets fair standards of performance	○	○	○	○
My supervisor communicates effectively	○	○	○	○
My supervisor provides coaching to help me achieve my goals	○	○	○	○
I am satisfied with the manner in which my supervisor handles complaints, grievances, and problems	○	○	○	○
My supervisor can be trusted to be straightforward and honest with me	○	○	○	○
It is easy to talk to my supervisor about things that go wrong on my job	○	○	○	○
My supervisor recognizes my ideas or suggestions for improvement	○	○	○	○
My supervisor sets a good example of customer service	○	○	○	○
My supervisor encourages me to find better ways to do things	○	○	○	○

TEAMWORK/COWORKERS	Strongly Agree	Tend to Agree	Tend to Disagree	Strongly Disagree
There is good communication among the members of our work group	○	○	○	○
There is good coordination of effort in my work group	○	○	○	○
My work group works together when a problem needs to be solved	○	○	○	○
Time is used efficiently in my work group	○	○	○	○
Members of my work group treat one another with dignity and respect	○	○	○	○
My work group is currently working to improve the quality of our service	○	○	○	○

STAFFING	Strongly Agree	Tend to Agree	Tend to Disagree	Strongly Disagree
This facility has enough staff to provide quality care	○	○	○	○
There is adequate staffing in my work group	○	○	○	○
The amount of work I have to do is reasonable	○	○	○	○
Staffing arrangements have not lowered performance in my work group	○	○	○	○
The reasons for the current staffing pattern in my department have been explained clearly to me	○	○	○	○

WORK ENVIRONMENT	Strongly Agree	Tend to Agree	Tend to Disagree	Strongly Disagree
The equipment I use is well maintained	○	○	○	○
I have the equipment I need to do my job well	○	○	○	○
Physical conditions (light, heat, space, appearance) in my area are good	○	○	○	○
My work area is clean	○	○	○	○

OVERALL ORGANIZATION IMPRESSION	Strongly Agree	Tend to Agree	Tend to Disagree	Strongly Disagree
This organization uses customer feedback to improve quality	○	○	○	○
Employees go out of their way to help and support patients	○	○	○	○
I am encouraged to come up with better ways of meeting customers' needs	○	○	○	○
This organization emphasizes the importance of customer service	○	○	○	○
Overall, the quality of care here is excellent	○	○	○	○
I would recommend the healthcare services provided here to my friends and relatives	○	○	○	○

What are the reasons for your answer to the above question? (Mark all that apply)

○ quality of care	○ customer focus	○ medical staff
○ nursing staff	○ location/convenience	○ range of services
○ cost of services	○ available medical technology	○ privacy/confidentiality

There are very high standards for performance here	○	○	○	○
This organization is highly regarded in the community	○	○	○	○
The values of this organization are evident in our everyday practices	○	○	○	○
I would recommend this organization to a friend as a good place to work	○	○	○	○
Overall, I am satisfied with this organization	○	○	○	○

OVERALL JOB FULFILLMENT	Strongly Agree	Tend to Agree	Tend to Disagree	Strongly Disagree
My work provides me an opportunity to be creative and innovative	○	○	○	○
My work makes good use of my skills and abilities	○	○	○	○
My work gives me a feeling of accomplishment	○	○	○	○
Overall, I am satisfied with my job	○	○	○	○
Overall, I feel confident that my job will be satisfying in the future	○	○	○	○
I plan to be working for this organization one year from now	○	○	○	○

Compared to two years ago, working conditions in my work group are:

○ Better ○ About the same ○ Worse

continued...

GENERAL QUESTIONS

To protect your confidentiality, responses to the following questions will be analyzed across the organization only and not by individual or work group.

I work: ○ Full time ○ Part time ○ Casual/PRN/As needed

My shift is: ○ Day ○ Evening ○ Night ○ Other

How long have you worked here?

○ Less than 2 years ○ 2 to 5 years ○ 6 to 10 years ○ More than 10 years

Do you supervise other employees (i.e., as a supervisor, manager, director, or Vice President)? ○ Yes ○ No

Which of the following best describes your job?

○ Registered Nurse ○ Office and clerical personnel ○ Service worker

○ Clinical professional ○ All other administrative services ○ Other Nursing Services

○ Technical worker ○ Skilled maintenance

I was born in: ○ 1945 or earlier ○ 1946 to 1964 ○ 1965 to 1983 ○ 1984 or later

REACTION TO SURVEY

	Strongly Agree	Tend to Agree	Tend to Disagree	Strongly Disagree
I think the survey results will be used in a positive manner	○	○	○	○
I think my responses will be kept confidential	○	○	○	○

COMMENTS

Your comments will be transcribed word for word. Please do not share any information that would identify yourself.

What is the best thing about working for this organization? _____

How can this organization improve working conditions? _____

This survey was current at the time of printing and distribution to you. If you would like to confirm that it is still the most recent version, please contact your consultant or Account Executive.

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