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Many organizations are putting their employee surveys online. We investigated workers' reactions to this trend by examining a military organization's transition to Web-based personnel surveys. Despite some initial anonymity concerns, opinion data from military and civilian employees, which were gathered before and during implementation, suggested the electronic survey was well-received.

As an information gathering tool, employee surveys play crucial roles in organizations worldwide. Individuals, departments, and institutions as a whole use data from personnel surveys to adapt and develop themselves in ways that help them meet the needs of subordinates, business associates, and other key stakeholders. Clearly, the workforce's willingness to participate in these surveys can significantly impact the larger organizational system. In fact, the success of any employee questionnaire depends upon the cooperation of personnel who volunteer the time and effort required to answer the survey items. These voluntary efforts have historically

involved the completion of paper-and-pencil questionnaires. Recent advances in technology have made electronic (e-mail and Web-based) surveys possible; consequently, a number of organizations are now moving their employee surveys online. At present, there is a dearth of research assessing how personnel feel about this transition. The current study addresses this hole in the literature.¹

Comparing Paper- and Web-based Surveys

Very little research has dealt with the differences between paper- and Web-based personnel surveys. The small amount of work that has been done tends to compare

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the two survey media from the organization's point of view. Two avenues of research have addressed this area of inquiry. The first examines the extent to which the survey medium affects data and measurement properties, and the second focuses on procedural issues.

From a measurement standpoint, initial evidence suggests that there are few overwhelming reasons for survey practitioners to prefer electronic surveys over paper ones, and vice-versa. A few past studies found that compared to their paper-and-pencil counterparts, electronic surveys yielded fewer missing data points, which occur when people fail to respond to particular survey items (Schaefer & Dillman, 1998; Stanton, 1998). In contrast, other work revealed that missing responses were somewhat more likely when surveys were completed electronically (Church, 2001; Paolo, Bonaminio, Gibson, Partridge, & Kallail, 2000; Yost & Homer, 1998). Additional research suggested that although people were no more likely to respond to open-ended questions when completing questionnaires online, electronic surveys did tend to encourage longer responses to open-ended questions (Paolo et al., 2000; Schaefer & Dillman, 1998; Yost & Homer, 1998). A study by Church (2001) indicated that online respondents were less likely to use a "don't know" survey scale option; yet, a follow-up initiative conducted within the same organization did not corroborate this finding. A meta analysis by Richman, Kiesler, Weisband, and Drasgow (1999) showed that, controlling for correlated observations, the use of computerized survey methods had a near-zero overall effect on social desirability distortion. Furthermore, research using a variety of data analytic approaches (ranging from simple analyses of item variability to covariance structure modeling and item response theory) have found little indication that paper and electronic surveys

differ in terms of their measurement properties (Donovan, Drasgow, & Probst, 2000; King & Miles, 1995; Magnan, Lundby, & Fenlason, 2000; Saphore, 2000; Spera & Moye, 2001; Stanton, 1998; Young, Daum, Robie, & Macey, 2000).

Measurement equivalence across the two media is generally regarded as good news. Such equivalence indicates that it is reasonable to aggregate responses generated from paper- and Web-based surveys administered simultaneously. It also suggests that trend data can be tracked accurately from surveys that are distributed at multiple points in time, even when different media are used for separate survey administrations. From an alternative perspective, measurement equivalence begs the question: why shift to Web-based survey methods if the two media produce essentially the same results? The answer to this question involves logistical issues. Paper- and Web-based survey administration procedures differ drastically, and the organization's procedural preferences typically drive the medium employed.

A paper survey requires administrators to print/photocopy questionnaires, collate survey packets, and mail materials to personnel. Employees complete the surveys by penciling in options (often on machine scannable "bubble" sheets) and writing open-ended responses (often on the survey booklet itself). Respondents mail completed forms to the survey administrator, who scans response data into the computer, types open-ended responses, puts data in a format that will be accepted by the statistical software package of choice, and analyzes the results. Often, charts and feedback mechanisms are constructed, meetings are scheduled with the workforce, and survey results are disseminated to respondents and key stakeholders. The entire procedure can be time-consuming, particularly when long

surveys are administered to organizations that span multiple sites distributed across large geographic distances.

From a logistical standpoint, electronic and paper survey procedures differ dramatically. A typical electronic survey requires the administrator to put the questionnaire online. Employees are e-mailed a hyperlink, which allows them to access the Web-based survey. Respondents may or may not be required to enter a passcode (a unique identification number) in order to access the questionnaire. Regardless, they complete the survey by clicking/selecting options and typing in text boxes, and they send their data instantaneously to the administrator by clicking a “send” or “submit” button. Survey administrators are allowed to monitor response rates on the fly, and data analyses (including feedback charts) may be pre-set and automatically updated every time a new respondent sends data electronically. Within a very short period of time, survey results can be disseminated to respondents and key stakeholders via the Web and/or face-to-face meetings.

Benefits for Web-based Survey Administrators

Web-based questionnaires can benefit survey administrators and organizations in numerous ways. Key advantages concern speed and cost-efficiency. Once the startup costs are absorbed, Web-based surveys can save money by reducing the paper, ink, mailing, and environmental costs associated with their paper-and-pencil counterparts (Sheehan & McMillan, 1999). Internet technology can decrease manpower costs by eliminating steps such as: photocopying surveys; mailing packets; typing, scanning, cleaning, and coding data; etc. Meanwhile, the survey is delivered to employees faster, responses are received much more quickly, and the data analysis/feedback steps are

automatic or accelerated (Sheehan, 2001; Sheehan & McMillan, 1999; Yun & Trumbo, 2000). These advantages have led some authors to suggest that electronic surveys are much more cost-efficient than paper alternatives (Couper, 2000; Dommeyer & Moriarty, 2000).

Employee Reactions to Web-based Surveys

Clearly, survey practitioners and organizations can profit from the efficiencies afforded by Web-based survey technology. A number of institutions are therefore shifting from paper-and-pencil to electronic personnel surveys. Unfortunately, this change is occurring in the absence of data concerning how employees feel about the prospect of completing their surveys online. Indeed, no known research has investigated this issue, which is not trivial. As previously suggested, volunteer respondents largely determine the success of any employee survey.

From one perspective, workers may appreciate the convenience of a Web-based survey. Environmentally friendly questionnaires can be sent via the click of a button, and data go directly to the survey administrators, thereby reducing the likelihood that supervisors or unauthorized others will see individual survey responses. Survey feedback may be sent to volunteer respondents quickly, particularly when administrators take advantage of the survey software’s automatic data analysis capabilities. Many people type faster than they write, making it easier to respond to open-ended items. Finally, Web-based surveys eliminate the possibility that a respondent can be identified based on his or her handwriting style.

On the other hand, electronic surveys may generate “big brother” suspicions or concerns that reassurances of anonymity could be breached by technology that traces electronic survey responses back to

individual computers or e-mail accounts. Moreover, a workforce with weak Internet self-efficacy beliefs are likely to resist online opportunities and experience stress-inducing problem situations when they do use the Internet (Eastin & LaRoste, 2000). Respondents physically hand paper-and-pencil surveys to couriers or designated others; alternatively, they cannot see their electronic data being sent to the survey administrator. Even when survey completion and transmission succeeds, respondents who do not trust technology may feel uncertain about whether their data were actually received by survey administrators.

The administrative advantages of electronic surveys notwithstanding, it is simply unclear how personnel feel about the prospect of completing their surveys online. If large or distinct segments of the workforce are not comfortable completing online questionnaires, response rates may dwindle and/or results may be skewed toward people who differ from non-respondents in meaningful ways. In light of these concerns, the current initiative provides a systematic, multi-method assessment of employee apprehensions and reactions to Web-based personnel surveys.

Method

Survey Background and Content

The current study concentrated on personnel working for a military organization. We investigated how this workforce felt about shifting their familiar "Command Climate Survey" from paper to the Web. The Command Climate Survey was designed for recurrent administration to civilian and military personnel who worked at the headquarters of this military organization. These personnel were responsible for providing numerous types of support (e.g., logistics) to operational units

distributed across multiple locations and deployed around the world.²

Most of the survey items used a rating scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). The survey measured personnel's perceptions of several areas of the command climate, including: general satisfaction, immediate supervision, senior leadership, training/development, personnel management, team cohesion, communications, and survey action.

Due to the amount of labor involved in administering and analyzing the paper-and-pencil version of the Command Climate questionnaire, the survey research staff proposed a Web-based alternative. To assess the workforce's attitudes toward this change, personnel were questioned both before and after the implementation of the Web-based version of the survey.

Phase 1: Assessing Attitudes Prior to the Online Survey

In order to identify the workforce's concerns regarding the possibility of a Web-based questionnaire, two items were added to the Command Climate Survey prior to the widespread distribution of the traditional paper-and-pencil version of the instrument. The first item was worded as follows: "I support the use of LAN or on-line surveying technology for the next command climate survey." Respondents were asked to use a five-point scale to rate their agreement with this statement. In the survey booklet, this item was preceded by an explanation of electronic surveying and followed by the second item – an open-ended question asking for comments related to the use of electronic surveying technology. This open-ended question was the source of qualitative data, which was used to understand why personnel may or may not support the use of electronic surveying technology. These two questions were asked on paper rather than electronically in order to avoid method-

biased responses. In October / November of 1998, this paper-and-pencil survey was distributed. Data collection was terminated after 14 days.

Phase 2: Assessing Attitudes After the Deployment of the Online Survey

Data from the 1998 survey were analyzed, and the next Command Climate Survey was scheduled for the year 2001. Prior to that date, an online survey format was constructed, pilot tested, and revised. (Format revisions were based on the pilot test, which asked more than 100 people to assess the usability of the online survey's layout). In July 2001, the Web-based survey was made available to the overall workforce. Personnel were notified via an e-mail message, which included a link to the secure survey site. The first section of the survey site included an introductory module, which provided information concerning response anonymity, the use of the data, and instructions for accessing and completing the survey. The survey itself followed the introductory module. Data collection was terminated after 10 days.

To assess reactions to the electronic survey, two measures were analyzed. First, we compared the 1998 (paper) and the 2001 (Web-based) survey respondents' replies to the following questionnaire item: "I am satisfied with the content and format of the command climate survey questionnaire." Participants were asked to use a 1 to 5 scale to rate their agreement with this statement. Because the survey content remained quite stable across the 1998 and 2001 administrations, ratings of this item were to provide an assessment of respondents' reactions to the survey medium.³ Second, we assessed the paper- and Web-based survey response rates to compare personnel's willingness to complete the two different versions of the survey.

Results

Phase 1: Assessing Attitudes Prior to the Online Survey

The 83-item paper survey was completed and returned by 437 employees (a 54% response rate).⁴ The sample consisted of 198 (45%) civilian personnel, 186 (43%) military personnel, and 53 (12%) personnel who did not reveal their classification. In terms of gender, 122 (28%) of the respondents were women, 256 (59%) were men, and 59 (13%) did not indicate their gender. The ethnic makeup of the sample was as follows: 73 (17%) African American; 8 (2%) American Indian; 14 (3%) Asian; 267 (61%) Caucasian; 11 (3%) Hispanic; and 64 (15%) undeclared. All directorates, which are functional groups (e.g., personnel management, information management, etc.), were represented in the respondent group.

Many respondents were supportive of the transition to Web-based surveys, as suggested by reactions to the questionnaire item that asked participants to use a 5-point scale to rate their support of Web-based technology for the next Command Climate Survey ($M = 3.43$, $SD = 1.33$). Each participant was placed into one of three categories, based on his or her response to the preceding question. Those who selected one of the top two scale options were considered *supportive*, those who chose the midpoint of the rating scale were considered *neutral*, and those who selected one of the bottom two scale options were assigned to the *does not support* category. Table 1 reports the degree to which members of various demographic groups expressed these positive, neutral, and negative reactions to online surveying. Approximately 213 (57%) of the total respondents indicated support for the future use of electronic surveying, while 71 (19%) indicated indifference and 92 (24%) did not support the use of electronic

surveying. Chi square (χ^2) tests of independence were computed to determine whether demographic groups differed significantly in their support of implementing electronic surveying. Men and women did not vary in terms of their support. Likewise, no single ethnic group was particularly inclined to endorse or reject the use of Web-based survey technology. Military and civilian personnel, however, differed significantly, as shown in Table 1. A t-test for two independent samples using the full 5-point scale corroborated the group difference ($t(340) = 3.84, p < .001$) and indicated that military personnel ($M = 3.77, SD = 1.21$) were significantly more supportive of electronic surveying than civilian personnel ($M = 3.24, SD = 1.34$). It should be noted, however, that there were significant differences between military and civilian respondents for most survey items and dimensions. With few exceptions, military personnel were more satisfied than civilians.

Next, we content analyzed the qualitative data resulting from the open-ended question related to electronic surveying. Eighty-one respondents (22% of the paper survey sample) provided comments. Our thematic content analysis, which was conducted to determine why the workforce may or may not support electronic surveying, involved reading and coding participants' remarks. Comments were first coded into categories related to their level of support for electronic surveying: *support, conditional support, do not support, and other comments*. This analysis indicated that 28 (35%) of the 81 participants who provided comments supported the use of electronic surveying techniques, 9 (11%) supported the use of electronic surveying under certain conditions, 21 (26%) did not support electronic surveying, and the remaining 23 (28%) provided comments that either made

no direct mention of level of support or were indifferent.

Some comments did not contain specific content other than expressing a level of support. The content-laden comments either gave reasons for the expressed level of support or addressed a process issue. Content-laden comments were coded into one of four overall groupings: *areas of concern, areas of benefits, process issues, and more information needed* (i.e., the respondents felt they needed more information before they could determine their level of support). Seventy-three comments were appropriate for this analysis. Of these, 59 (81%) addressed areas of concern with electronic surveying. The top issue related to anonymity/confidentiality ($n = 44$). Other concerns involved: data quality ($n = 7$), a lack of access to the LAN/Internet ($n = 3$), data security ($n = 2$), computer literacy / need for training ($n = 2$), and the inability to complete an electronic survey at home ($n = 1$). Next, 8 (11%) of the content-laden comments addressed the benefits of electronic surveying, including more effective use of resources ($n = 4$), process improvement ($n = 3$), and environmental friendliness ($n = 1$). The remaining 6 (8%) of the 73 comments were related to process issues ($n = 3$) and the need for more information ($n = 3$).

Phase 2: Assessing Attitudes After the Deployment of the Online Survey

The 73-item electronic version of the Command Climate Survey was completed and returned by 403 employees (a 60% response rate) in July 2001.⁴ In terms of relevant demographic variables, the sample was virtually identical to the 1998 paper survey respondent group. The 2001 survey was completed by 226 (56%) civilian personnel, 168 (42%) military personnel, and 9 (2%) personnel who did not reveal their classification. In terms of gender, 139

(35%) of the respondents were women, 253 (63%) were men, and 11 (3%) did not indicate their gender. The ethnic makeup of the sample was as follows: 72 (18%) African American; 3 (1%) American Indian; 8 (2%) Asian; 261 (65%) Caucasian; 17 (4%) Hispanic; and 17 (4%) were undeclared. As with the paper-and-pencil survey, all directorates were represented in the respondent group.

As previously noted, the 1998 and the 2001 surveys included essentially the same survey items. Both instruments asked respondents to use a 5-point rating scale to indicate their satisfaction with the content/format of the Command Climate Survey. For ease of reporting, the five-point scale was again collapsed into three categories: *satisfied* (the top two scale options), *neutral* (the midpoint of the rating scale), and *dissatisfied* (the bottom two scale options). Figure 1 depicts the percentage of respondents who felt dissatisfied, neutral, and satisfied with the 1998 paper survey ($n = 437$) and the 2001 electronic survey ($n = 403$). As can be seen, 13% of the paper-and-pencil respondent group was dissatisfied with the survey, whereas only 7% of the online respondent group expressed dissatisfaction. Similarly, the percentage of respondents that felt neutral about the paper-and-pencil survey (31%) exceeded the percentage that felt neutral about the Web-based survey (19%). Lastly, the percentage of participants that felt satisfied with the paper-and-pencil survey (57%) was substantially smaller than the percentage that felt satisfied with the electronic survey (74%). In short, the transition to Web-based questionnaires was accompanied by an overall increase in satisfaction with the survey instrument.

Finally, we examined the workforce's willingness to complete the paper- versus the Web-based versions of the survey. According to this analysis, the

questionnaire's transition to the Web was accompanied by a slight increase in response rate. Approximately 60% of the workforce completed the electronic survey, whereas only 54% completed the paper version that preceded it.

Discussion

This study provided a multi-method assessment of people's apprehensions and reactions to Web-based surveys by questioning workers both before and after their personnel survey went online. This initiative was designed to provide an initial estimate of the ease with which employees working in real-world settings will freely complete personnel surveys that are conducted online. Volunteer respondents drive the success of any employee questionnaire; therefore, this research has important implications for a wide variety of organizations considering the transition from paper-and-pencil surveys to electronic ones.

In general, the Phase 1 pre-assessment of personnel's attitudes concerning Web-based surveys indicated that most employees were not against the idea of moving their survey online. In fact, according to the Phase 1 rating data, more than 75% of the sample was either supportive of or indifferent to the use of Web-based surveys, suggesting that the transition would not meet a great deal of opposition. A number of those who supported the transition mentioned key benefits associated with the use of technology. Among those who opposed Web-based surveys, confidentiality was the primary issue. It is worth noting that we regarded the preceding apprehensions very seriously and took extra steps to ensure confidentiality when the Web-based survey was deployed.⁵ Once it was implemented, personnel seemed to respond to the 2001 electronic survey quite positively. According to our Phase 2 analyses, the

electronic survey's response rate was higher than the paper-and-pencil response rate, and rating data suggested that respondents preferred the electronic medium over the paper-and-pencil format.

It is important to recognize that variables other than the survey medium could have caused personnel to respond to the 1998 and 2001 survey formats differently. It would be useful for follow-up research to employ random assignment and compare people's reactions to identical paper and electronic surveys administered simultaneously. As is often the case with field research, we exchanged some degree of internal validity for external validity. We chose a multimethod assessment of the workforce's attitudes toward Web-based surveys, in order to compensate for the preceding limitation.

In terms of additional research, a variety of future studies are needed in this area. For instance, it would be useful for the research community to focus on identifying the kinds of personnel who do not complete Web-based surveys and the reasons for these non-responses. Data from our paper-based questionnaire provided an initial indication of the most common concerns (e.g., confidentiality); further research should follow up on whether these concerns

actually prevent people from responding to electronic surveys. Also it would be useful to identify the personal characteristics of those who do not respond to Web-based surveys. Non-respondents may differ from respondents in terms of variables such as Internet self-efficacy, for instance.

The literature suggests that a "digital divide" separates those who are and are not comfortable with Internet technology, and demographic variables such as race are related to this problem (Eastin & LaRose, 2000). It is encouraging to note that, when questioned via a paper questionnaire, no single gender or ethnic group was particularly inclined to reject the possibility of an electronic survey. Moreover, the paper- and Web-based respondent groups appeared quite similar in terms of key demographic variables. From a practical standpoint, this suggests that the survey technology is not systematically excluding any particular group of respondents.

Finally, it is heartening to note that the workforce seemed to like the online version of their personnel survey. This suggests that organizations that are thinking about moving their employee questionnaires online will not meet great amounts of resistance if they are sensitive to the concerns of the workforce and proceed accordingly.

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Footnotes

¹ The current study is part of a broader initiative, which examined multiple aspects of an organization's transition toward Web-based surveys (e.g. the development of survey software evaluation criteria, electronic survey pilot test procedures and results, etc.). The entire project description, which would span dozens of pages, is beyond the scope of this paper.

² The Command Climate Survey discussed in this study covers the military headquarters staff only; it is not used for operational units and subordinate commands.

³ To provide as direct a comparison with the paper-based survey administration as possible, the 2001 electronic questionnaire included the items developed for the 1998 paper survey. The two surveys were therefore essentially the same in terms of content, with small exceptions (e.g., a non-controversial survey dimension, titled

military-civilian relations, was dropped after 1998).

⁴ The Command Climate Survey asked several open-ended questions; the survey item totals reported here do not factor these open-ended questions in.

⁵ During the development and implementation phases of the Web-based version of the survey, special care was taken to alleviate confidentiality concerns. For instance, the Web-based questionnaire's introductory module included assurances of anonymity. Furthermore, survey passcodes were not required. Passcodes are beneficial because they help ensure that responses are received only once from each participant. On the downside, passcodes seemingly heighten anonymity concerns. After some discussion, passcodes were decided against. The likelihood that personnel would want to complete the survey more than once was perceived to be quite small, and we considered it important to assure the workforce that responses would remain anonymous.

Table 1. Support for Electronic Surveys by Demographic Groupings

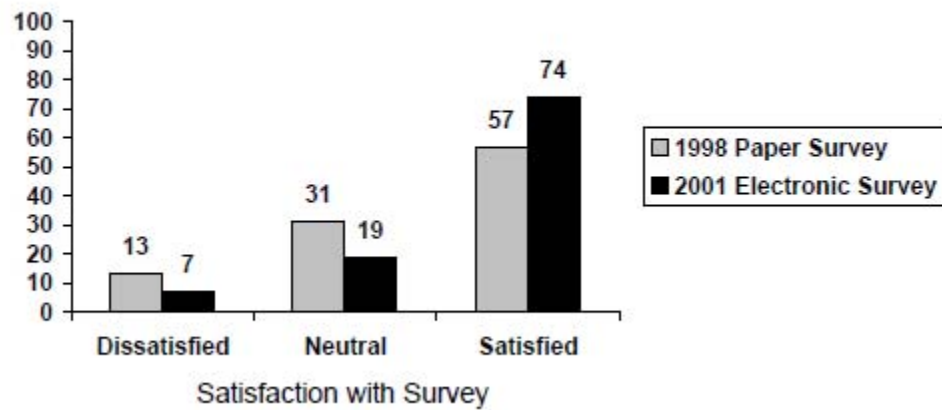
Groupings	Level of Support			Totals <i>n</i>	χ^2	<i>df</i>	<i>p</i>
	Support <i>n</i> (%)	Neutral <i>n</i> (%)	Do Not Support <i>n</i> (%)				
Gender ^b					0.87	2	.646
Male	143 (61%)	46 (19%)	47 (20%)	236			
Female	56 (55%)	21 (21%)	24 (24%)	101			
Classification ^{b,c}					14.43	2	.001
Civilian	85 (49%)	37 (21%)	51 (29%)	173			
Military	114 (67%)	37 (21%)	24 (14%)	169			
Ethnic Group ^b					5.37	8	.718
African American	44 (69%)	11 (17%)	9 (14%)	64			
American Indian	4 (57%)	1 (14%)	2 (29%)	7			
Asian	7 (54%)	3 (23%)	3 (23%)	13			
Caucasian	137 (57%)	47 (20%)	55 (23%)	239			
Hispanic	8 (80%)	1 (10%)	1 (10%)	10			
Subset of Ethnic Group ^b					3.18	2	.204
African American	44 (69%)	11 (17%)	9 (14%)	64			
Caucasian	137 (57%)	47 (20%)	55 (23%)	239			
Overall Sample Totals	213 (57%)	71 (19%)	92 (24%)	376			

Note. Percentages provided in parentheses are based on the group total that appears in the same row. Percentages are rounded to the nearest whole number. Percentages in the same row may not total to 100% due to rounding error.

^aThe original 5-point scale was collapsed into three categories for ease of presentation. Each of the chi square analyses presented above were also run on the full 5-point scale. In all cases, the two analysis types led to the same conclusions regarding group similarities / differences. ^b Respondents who failed to report the relevant demographic information were excluded from this analysis. ^c Civilian and military respondents differed significantly.

Figure Caption

Figure 1. Percentage of respondents who felt dissatisfied, neutral, and satisfied with the 1998 paper survey ($n = 437$) and the 2001 electronic survey ($n = 403$).



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