

Differences in responses to Web and paper surveys among school professionals

GEORGETTE YETTER AND KRISTEN CAPACCIOLI
Oklahoma State University, Stillwater, Oklahoma

This experiment investigated the effects of survey administration mode (Web vs. paper and pencil) and survey length (short or long) on the responses of a large sample of primary and secondary school professionals in the U.S. The 812 participants in this study were part of an initial random sample of 1,000 individuals representing 5.81% of the membership of a national professional organization. The participants were randomly assigned to each of the four treatment conditions. Results indicated (1) substantially lower response rates for Web surveys than for same-length paper surveys; (2) a higher response rate for short surveys than for long surveys with paper, but not Web, questionnaires; and (3) a younger age for Web respondents, as compared with their paper counterparts. In light of prior research, we suggest that paper-and-pencil methods be used for surveying professionals in primary and secondary school settings.

Over the past 15 years, the expansion of Internet technology has changed the way professionals communicate and conduct survey research (Couper, 2005). Over 250 survey research studies have been completed using the Internet (Reips & Lengler, 2005). Web surveys have several advantages over traditional paper surveys: greater convenience, lower cost, faster transmission, more rapid response, and fewer data entry errors (Cobanoglu, Warde, & Moreo, 2001; Dillman, 2000; McDonald & Adam, 2003; Sheehan & McMillan, 1999). The ease of transmission of Internet surveys allows researchers to gather information from geographically and demographically diverse samples, facilitating access to a wider range of individuals (Reips, 2002). Surveys administered online also may be less vulnerable than paper-and-pencil questionnaires to decrements in response rate as a result of increases in survey length (Cook, Heath, & Thompson, 2000; Dillman, 2000), although these findings have been mixed (cf. Marcus, Bosnjak, Lindner, Pilischenko, & Schutz, 2007; Sheehan, 2001).

Although online surveys have distinct advantages over their offline counterparts, some reasons for caution have been noted. Differences in response rates have been reported for Web and mail questionnaires, with some investigations indicating higher Web response rates (Cobanoglu et al., 2001; McCabe, Couper, Cranford, & Boyd, 2006) and others reporting no differences (Gosling, Vazire, Srivastava, & John, 2004; Kaplowitz, Hadlock, & Levine, 2004) or lower Web response rates (Bachmann, Elfrink, & Vazzana, 2000; Weible & Wallace, 1998). In addition, Web surveys are linked with substantially higher rates of nondelivery. Nondelivery rates between 18% and 67% have been reported for electronic mail surveys (Bachmann et al.,

2000; McDonald & Adam, 2003), contrasting sharply with negligible nondelivery rates for paper surveys. Although electronic nondelivery rates have decreased in recent years (McDonald & Adam, 2003), the number of e-mails that fail to reach their intended recipients but that are not returned to their senders (e.g., ones that are rerouted by spam filters) cannot easily be ascertained.

Familiarity with Internet technology is not uniform across demographic, cultural, and geographic groups. On the whole, Internet users are younger, richer, better educated, and more urban than non-Web users (Reips, 2002). Whereas gender differences in response rates are seldom found with traditional paper surveys (Heberlein & Baumgartner, 1978), Web surveys are more likely to be completed by males than by females (McCabe et al., 2006; McDonald & Adam, 2003; Stanton & Rogelberg, 2001). One possible explanation proposed for this finding is that females may experience lower levels of Internet self-efficacy than males (LaRose, Mastro, & Eastin, 2001).

The inconsistencies in many prior findings make it difficult to draw clear conclusions about *best practices* for administering surveys. Studies of the impact of age on response rates for Web and postal surveys have reported mixed results. Several recent inquiries concluded that Web respondents were younger than their paper survey counterparts (Kaplowitz et al., 2004; Stanton & Rogelberg, 2001), but others have reported that Web participants were older (Birnbaum, 1999; Pasveer & Ellard, 1998). Coverage bias, the bias attributable to sampled individuals not having access to the Internet or choosing not to access it, thus has led to questions regarding the generalizability of Web survey responses (Gosling et al., 2004; Sheehan & McMillan, 1999; Solomon, 2001).

G. Yetter, georgette.yetter@okstate.edu



Some, but not all, research has noted different response patterns for surveys administered using Web versus paper-and-pencil methods. McDonald and Adam (2003), for example, reported that responses by sports club members to online and paper surveys diverged for one third of their questions, even when controlling for participants' demographic differences, and that these ratings were inequivalent even when demographically matched subsamples were extracted. In contrast, McCabe et al. (2006) found no differences in outcome for Web, as compared with paper, surveys when questioning undergraduate students about substance use.

In the past several years, in order to better understand the impact of specific factors on the relative advantages of the different survey administration modes, researchers have begun to conduct more fine-tuned analyses (e.g., Marcus et al., 2007; Nulty, 2008). In a recent study, for example, Marcus et al. examined the differential effects of topic interest, survey length, presence of incentives, and feedback of survey results on the response rates for Web and paper surveys. Having a better understanding of the impact of specific factors that contribute to differences in outcomes between online and postal surveys promises to benefit the research community by identifying ways in which survey practices can be refined to capitalize on the strengths of both Web and paper survey methods. Such fine-tuning will allow survey researchers to tailor their methodological choices to their target populations and to their particular conditions.

Evidence has begun to emerge suggesting that differences in *professional culture* (professional work environments or customary professional practices) have an impact on professionals' responsiveness to Web surveys. Professional culture includes both the particular field (industry) in which an individual is employed and the type of position individuals hold within a given industry. An interesting recent investigation by Diment and Garrett-Jones (2007) indicated that Web surveys were more likely to be completed, for example, by professionals employed in the fields of information technology or manufacturing, whereas paper surveys were more likely to be completed by professionals in medicine or in the mining industry. Across fields, individuals in certain types of positions (such as senior management) were disproportionately more likely to respond to paper surveys, whereas individuals employed in other positions (e.g., postdoctoral employees) were more likely to respond to surveys administered over the Internet. These findings suggest that it is important for survey researchers to investigate the survey mode preferences of individuals employed in various professions and professional settings to inform decisions regarding which survey modalities may be indicated (Diment & Garrett-Jones, 2007).

Prior investigation of the relative merits of Web and postal technology when surveying primary and secondary education personnel has, to date, been very limited, but the extant research suggests that education personnel are less likely to respond to Internet surveys than to questionnaires administered via traditional postal methods. Mertler (2003) administered questionnaires to uni-

versity students training in primary or secondary schools to become teachers. Mertler found that the participants were less likely to respond when invited by e-mail to complete a 35-item questionnaire on the Internet than they were when solicited by postal mail (11% vs. 21% response rates, respectively).

The present study compared the response rates and response content reported by school psychologists (termed *educational psychologists* in some European countries) either (1) contacted via e-mail and invited to participate in an online survey or (2) contacted by postal mail and invited to take part in a paper-and-pencil survey. We hypothesized that (1) response rates would be lower for Web surveys than for the same-length paper questionnaires; (2) shorter surveys would have a higher response rate than longer surveys for both online and paper modes of administration; (3) Web respondents would be younger than paper survey respondents; (4) a larger proportion of Web respondents than paper survey participants would be male; and (5) the responses to the questionnaire would be different for Web surveys than for paper surveys.

METHOD

Participants

A list of names and U.S. mail addresses of 1,000 school psychologists employed in K-12 settings was purchased from the National Association of School Psychologists (NASP). This random sample represented 5.81% of the population of approximately 17,200 members of NASP employed primarily in primary or secondary schools (Curtis, Hunley, Walker, & Baker, 1999; Fagan, Gorin, & Tharinger, 2000). Of these 1,000 individuals, 188 members who had not filed their e-mail addresses with NASP were excluded from the study. The remaining 812 NASP members were invited to participate in the study. The pool of 812 participants was randomly divided into quarters, with 203 individuals assigned to each of the four possible combinations of survey type according to length (short or long) and mode of administration (online or paper).

The member data that NASP provided did not include gender, age, or ethnicity information, and it did not specify the primary grade level of members' place of employment. However, a 2004-2005 survey of NASP members reported that three quarters (74%) were female and most (80%) were practitioners, with a mean age of 45.2 years among practitioners. The overwhelming majority of NASP members (92.6%) were Caucasian, with far smaller numbers of African Americans (1.9%) and Latino/as (3.0%). These demographic characteristics also reportedly represent the population of school psychologists (Curtis, Lopez, Batsche, & Smith, 2006).

Materials

The participants were invited to answer a survey, ostensibly to indicate their perceptions of prereferral intervention teams in their schools. The actual purpose of the study, to compare the response rates for paper-and-pencil surveys with those for their online counterparts, was not revealed to the participants, in order to maximize the likelihood of obtaining response rates unbiased by any preconceptions the respondents may have held regarding the preferability of paper-and-pencil, as compared with online, survey modalities. The survey asked the participants to indicate their perceptions of prereferral intervention teams for addressing children's school-related academic and behavior difficulties. Because this was a timely topic for K-12 educators, given recent changes in education law (Individuals With Disabilities Education Improvement Act, 2004), issues pertaining to prereferral teams were felt to be salient to school psychology practitioners and, therefore, likely to result in participants' moderate to high motivation to respond to the survey.

Two versions of the survey were used. The first was a 15-item scale previously developed for assessing the acceptability perceptions of K–12 school personnel regarding prereferral teams (Yetter & Doll, 2007), followed by five demographic questions. The 15 items on this *short* Likert questionnaire were rated on six response options ranging from *strongly disagree* to *strongly agree*, where higher ratings indicated more favorable perceptions. A previous investigation indicated high internal consistency of these items ($\alpha = .95$; Yetter & Doll, 2007).

The second (*long*) survey version contained the same 15-item acceptability scale as the short survey, followed by an additional 51 items asking about the effectiveness of prereferral teams, amount of work-related stress they experience, and levels of collaboration and cohesiveness in their teams, concluding with the same five demographic questions as the short survey. Of the 71 Likert items on the long survey, 24 questions were rated on six response options, and 41 were rated on five response options. All items for the Web participants were identical to those for the paper survey participants.

Design and Procedure

The study was conducted in March and April of 2006. Identical survey procedures were used to contact all the participants. First, written advance invitations to participate were sent. Then survey packets (for the paper survey participants) and e-mails (for Web participants) providing direct access to the survey through a universal resource locator (URL) were sent, followed by two reminders to participate. The primary outcome measure was the response rate of the participants in each of the four treatment conditions (long online, short online, long paper-and-pencil, short paper-and-pencil). Secondary outcome measures included their demographic characteristics and the overall pattern of favorability in their responses to the questions pertaining to the appropriateness and effectiveness of prereferral intervention teams for addressing students' problems.

Paper survey. Advance invitations were mailed to all the paper survey participants on the same day in the last week of March, informing them that they soon would receive a survey and advising them that their input was valuable and would be appreciated. The survey packets were mailed 12 days later; the first follow-up reminders were sent 10 days following the mailing of the survey, and the second follow-up reminders were sent 4 days after the first follow-up reminder. Advance invitations to participate and follow-up notices were printed on postcards bearing the university logo and university return address. Survey packets contained a cover letter, printed on university letterhead, folded together with an information sheet describing the study, a paper survey, and a postage-paid business reply envelope. All communications with the paper survey participants were made by first-class U.S. mail.

Web survey. The advance invitations, access to surveys, and first and second follow-up reminders were sent by electronic mail to all the Web participants 3 days later than they were mailed to the paper participants, in an effort to equalize the anticipated date of receipt for Web and paper correspondence (allowing 3 days for receipt of first-class U.S. mail). All contacts with Web participants were made by electronic mail from the investigator's university e-mail account. E-mails were sent to the participants in groups of 10 or fewer electronic messages, in an effort to avoid triggering the recipients' automatic spam filters. E-mail invitations contained a cover letter with text identical to the paper survey cover letter, but with modifications to the response option addresses, instructions about how to return the survey, and a link allowing direct access to a university Web site containing the online surveys. All Web communications were designed to be as similar as possible in appearance to their paper counterparts.

Microsoft Office FrontPage (Microsoft Corporation, 2003) was used to develop and post the online survey. On the Web page devoted to this research study, visitors could click on a link to access the investigator's university Web page showing her photo, contact information, and curriculum vita. The participants were asked to read a consent form and click a *radio button* (an empty circle that, when

clicked on, became darkened) on the online form to indicate that they had read and understood it and had agreed to participate.

The online survey was made to look as similar as possible to the printed version. It appeared in black and white only, and the radio buttons were presented in *click* format. The participants were able to navigate forward and backward through the survey instrument by clicking on one of two arrows labeled "next" and "back" at the bottom of each screen. On completing the questionnaire, the participants were presented with a "Success" Web page.

Four graduate students in school psychology prepiloted the Web surveys and provided feedback about the face validity, the readability of the screens, and the ability to navigate back and forth among the survey pages. Then several Internet users, including two elementary school teachers, piloted the site from a variety of browsers (Internet Explorer, Firefox, Safari, Konqueror, and Netscape) and platforms (Windows, Macintosh, and Linux) by going to the survey URL sent to them by electronic mail. The pilot individuals found the survey easily accessible and navigable, and they estimated the duration to complete the long Web survey to be 10 min or less.

ANALYSES AND RESULTS

Several analyses were conducted to compare the demographic characteristics of the respondents with the practitioner members of NASP. A single-sample *t* test determined that our sample was younger [$t(233) = -2.464$, $p = .014$]. A larger percentage of our respondents was female [$\chi^2(1, N = 238) = 10.42$, $p = .001$]. The ethnic distribution of our respondents was the same as that of NASP practitioners [$\chi^2(4, N = 238) = 6.991$, $p = .136$].

Hypothesis 1

Table 1 summarizes the response rates according to survey length and administration format. Two chi-square analyses were conducted to determine whether or not there were differences in response rates between long Web and long paper surveys and between short Web and short paper surveys. Regardless of length, Web questionnaires were far less likely to be completed and returned than their paper counterparts [$\chi^2(1, N = 134) = 31.85$, $p = .0000$, for the short survey; $\chi^2(1, N = 105) = 18.85$, $p = .00001$, for the long survey]. Then, to quantify the difference in response rate between Web and paper surveys, a logistic regression analysis was carried out, with survey length and administration mode as predictors and presence or absence of response as outcome. Hosmer and Lemeshow's (2000) R^2_L indicated that 8.44% of the variance in response was ac-

Table 1
Response Rates by Mode of Administration and Survey Length

	Web			Paper		
	Short	Long	Total	Short	Long	Total
Sample size	203	203	406	203	203	406
No. undeliverable	14	11	25	5	2	7
% undeliverable	6.9	5.4	6.2	2.5	1.0	1.7
Effective sample size	189	192	381	198	201	399
Surveys completed	33	29	62	101	76	177
Response rate (%)	17.5	15.1	16.3	51.0	37.8	44.4

Note.—Sample size, number of survey invitations sent; % undeliverable, number undeliverable/sample size; effective sample size, sample size minus number of undeliverable surveys; response rate, surveys completed/effective sample size.

counted for by mode and length. Overall, controlling for survey length, the odds of response were decreased by a factor of 0.241 for Web surveys, as compared with paper surveys. Two additional logistic regression analyses, with administration mode as predictor and response as outcome, measured the difference in response between Web and paper questionnaires for each length. When the questionnaires were short (20 items), administration by Web decreased the odds of responding by a factor of 0.203, as compared with the odds of responding by paper, and when the questionnaires were long (71 items), administration by Web, rather than by paper, decreased the odds of responding by a factor of 0.541.

Hypothesis 2

Table 1 outlines the response rates for Web and paper surveys of each length. Two chi-square analyses determined whether or not there were differences in response rates between short and long paper surveys and between short and long Web surveys. When administered in paper form, short surveys were more likely to have been completed than long surveys [$\chi^2(1, N = 177) = 4.05, p = .044$]. For questionnaires administered on the Web, however, no length-related difference in response rate was found [$\chi^2(1, N = 62) = 0.326, p = .568$]. A simple logistic regression, with survey length as predictor and response as outcome, showed that for individuals who responded to the paper questionnaire, the odds of responding to the long version of the survey decreased by a factor of 0.584, as compared with the odds of responding to the short survey.

To investigate the possibility that the interaction of length and administration mode affected response rate over and above the separate effects of length and mode, an additional binary logistic regression analysis was conducted. In this analysis, the predictor consisted of the interaction, encoded as a single variable with four values (short Web, short paper, long Web, long paper); the outcome was the presence or absence of response. Hosmer and Lemeshow's (2000) R^2_c indicated that 8.55% of the variance in response was accounted for by the mode \times length interaction. By

comparing this interaction model with the results of the main effects model conducted as a follow-up for Hypothesis 1, it is evident that the interaction between survey length and administration mode explained only 0.11% of the variance in response over and above the main effects of length and mode, and that the model chi-square resulting from the comparison of the interaction and main effects models was [$\chi^2(1) = 1.119, p = .29$]. In sum, the length \times mode interaction did not improve the ability to predict response rate over and above the main effects of length and mode.

Hypothesis 3

The mean ages of Web and paper survey respondents are given in Table 2. An independent samples t test was conducted to look for differences in age by response mode. No age differences were found between participants responding to Web surveys and those who completed paper surveys [$t(233) = 1.929, p = .055$].

Hypothesis 4

Table 2 displays the gender distribution of Web and paper respondents. A chi-square analysis was performed to determine whether or not males were more likely than females to respond to Web surveys. The participants who responded to Web surveys were not more likely to be male than those who responded to paper surveys [$\chi^2(1, N = 43) = 0.004, p = .950$].

Because prior research has indicated that males are more likely to respond to Web than to paper surveys and that older individuals are more likely to respond to paper than to Web surveys, follow-up analyses were conducted to determine whether our lack of main effect findings for Hypotheses 3 and 4 resulted from age and gender effects masking each other. To explore this possibility, a simple logistic regression analysis was performed, with age as the predictor and gender as the outcome. The results showed that age and gender were related (Wald test = 4.47, $p = .035$). Among respondents, males were older than females, such that for each increase of 1 year in age, the

Table 2
Age, Gender, Ethnicity, and Primary Employment Setting of Respondents

	Respondents		
	Web	Paper	All
Age (years): Mean (<i>SD</i>)	40.9 (10.7)	44.2 (11.9)	43.3 (11.6)
Gender			
No. female (%)	49 (79.0)	145 (81.9)	194 (81.2)
No. male (%)	11 (17.7)	32 (18.1)	43 (18.0)
No. not reported (%)	2 (3.2)	0 (0.0)	2 (0.8)
Ethnicity			
No. Caucasian (%)	55 (88.7)	159 (89.8)	214 (89.5)
No. African American (%)	3 (4.8)	7 (4.0)	10 (4.2)
No. Latino/a (%)	1 (1.6)	5 (2.8)	6 (2.5)
No. other (%)	1 (1.6)	4 (2.2)	5 (3.8)
No. not reported (%)	2 (3.3)	2 (1.2)	4 (2.1)
Primary Employment Setting			
No. elementary school (%)	39 (62.9)	80 (45.2)	119 (49.8)
No. junior high or middle school (%)	8 (12.9)	31 (17.5)	39 (16.3)
No. high school (%)	7 (11.3)	43 (24.3)	50 (20.9)
No. other school (%)	8 (12.9)	21 (11.9)	29 (12.1)
No. not reported (%)	0 (0.00)	2 (1.1)	2 (0.9)

odds of a respondent's being male increased by a factor of 1.032. This finding suggested that there was a basis for further investigation of the possibility that the absence of main effect findings that we reported for age and gender with respect to survey mode could be attributable to the older age of the male respondents. Two further analyses were undertaken. First, a logistic regression, with survey mode and respondent age as predictors and gender as the outcome, showed no significant relationship between mode and gender when age was taken into account (Wald test = 0.061, $p = .804$). Finally, a linear regression, with survey mode and gender entered together as predictors and with age as outcome, indicated that after accounting for gender, Web respondents were not younger than their paper survey counterparts [$t(230) = -1.932, p = .055$]. We conclude that the lack of main effect findings for Hypotheses 3 and 4 was not due to age and gender effects masking each other and that administration mode did not introduce an age or gender bias in response.

Hypothesis 5

Each participant's Likert ratings on the 15-item acceptability scale were summed to form a total score with a possible range of 15–90. The mean acceptability ratings were 75.4 ($SD = 10.3$, range = 43–90) for Web participants and 74.6 ($SD = 10.1$, range = 19–90) for paper survey participants. An independent samples t test indicated that mode of administration had no effect on total scores [$t(233) = -0.522, p = .602$]. A subsequent analysis investigated the possibility that the participants' ratings on the acceptability measure may have varied as a function of their gender, age, or the length of their survey, and that relationships among these variables may have concealed systematic differences in the acceptability scores of Web and paper respondents. In this multiple regression analysis, gender, age, survey length, and mode were entered together as predictors, with acceptability score as the out-

come. The results showed that controlling for gender, age, and mode, survey length predicted acceptability ratings [$t(232) = 2.952, p = .003$]. Acceptability scores from 71-item surveys were more favorable than those from 20-item surveys.

Cronbach's coefficient alpha also was calculated to assess the internal consistency of the 15-item acceptability scale for Web and paper survey participants. The W statistic (Feldt & Ankenmann, 1999) was used to compare the internal consistency of the acceptability ratings on Web surveys with the acceptability ratings on paper surveys. Cronbach's coefficient alphas for Web and paper surveys also were compared with various combinations of participant age, gender, and survey length. As Table 3 shows, responses to the acceptability scale were more consistent when administered in long surveys over the Web than they were when given in long form by paper. This was true for all the participants [$W(27,62) = 1.89, p = .020$] and also among females [$W(22,50) = 1.94, p = .027$].

DISCUSSION

The present study employed experimental methods to examine the effect of survey delivery medium and survey length on response rates and response content. The results supported or partially supported two of the five hypotheses.

As predicted in Hypothesis 1, participants were far more likely to complete traditional paper-and-pencil surveys than online questionnaires, both for shorter and longer surveys. Our results, taken together with those of Mertler (2003), suggest that paper-and-pencil format may be preferable when surveying professionals employed in primary or secondary schools. As Mertler noted, it seems likely that the lower response rate for Web participants is due largely to educators' lack of familiarity with technological skills and to the absence of ready access to computers at their

Table 3
Comparison of Cronbach's Alphas for Web and Paper Surveys

Comparison	Sample Size		Cronbach's α		W	Degrees of Freedom	
	Web	Paper	Web	Paper		Numerator	Denominator
Web vs. paper	62	177	.94	.94	0.983	60	146
Short Web vs. short paper	32	100	.93	.96	0.652	30	81
Long Web vs. long paper	29	74	.93	.86	1.89*	27	62
Male Web vs. male paper	11	32	.91	.93	0.733	10	26
Female Web vs. female paper	49	142	.95	.94	1.12	47	117
Older Web vs. older paper ^a	37	116	.94	.93	1.06	35	94
Younger Web vs. younger paper ^a	24	56	.94	.95	0.879	21	47
Short male Web vs. short male paper	6	18	.93	.96	0.581	10	14
Long male Web vs. long male paper	5	14	.90	.84	1.66	4	11
Short female Web vs. short female paper	25	82	.94	.96	0.729	24	66
Long female Web vs. long female paper	24	60	.93	.87	1.94*	22	50
Older male Web vs. older male paper ^b	6	18	.88	.93	0.570	could not be calculated ^c	
Younger male Web vs. younger male paper ^b	14	5	.94	.94	1.03	could not be calculated ^c	
Older female Web vs. older female paper ^b	33	100	.95	.93	1.29	31	81
Younger female Web vs. younger female paper ^b	16	40	.95	.95	0.922	15	33

^aAge breakpoint between older and younger respondents was calculated as the median of the median ages for each mode of administration. The resulting breakpoint was 36 years. ^bFor each gender, the age breakpoint between older and younger respondents was calculated as the median of the median ages for each of the four treatment conditions. The resulting breakpoints were 47 years for males and 34 years for females. ^cComputations not possible due to small sample sizes. * $p < .05$.

work setting. Our findings also may, to some extent, be attributable to the overwhelmingly female gender composition of the sample. Although our sample accurately represents the gender composition of education professionals (Curtis et al., 2006), studies of other professional populations have shown that males are more likely than females to complete Web surveys (McCabe et al., 2006; McDonald & Adam, 2003).

Consistent with Hypothesis 2, in this investigation, shorter surveys evidenced higher response rates for paper questionnaires. There was, however, no relationship between survey length and response rate for online surveys. These findings are consistent with those in Cook et al. (2000) but inconsistent with those in Sheehan (2001). It would appear, then, that for education professionals, survey length is a more important design consideration for questionnaires administered offline than it is for surveys given online. Also, consistent with prior research, our nondelivery rate for invitations to participate in the survey was considerably higher for the Web participants than for the paper survey participants (6.16% vs. 1.72%). Nevertheless, our 6.16% rate was considerably lower than that reported in many published studies (Bachmann et al., 2000; McDonald & Adam, 2003).

Hypotheses 3 and 4 were not supported. Inconsistent with prior research (Kaplowitz et al., 2004; Stanton & Rogelberg, 2001), neither age nor gender differences were found between Web and paper survey respondents. Interestingly, the previously reported differential response rates in favor of paper surveys for older respondents (Kaplowitz et al., 2004; Stanton & Rogelberg, 2001) and in favor of Web surveys for males (McCabe et al., 2006; McDonald & Adam, 2003; Stanton & Rogelberg, 2001) did not account for our lack of main effect findings, even though, on average, the males in our sample were older than the females.

Over the past few years, Web survey methodology research has begun to attend to the impact of specific participant characteristics and environmental conditions on survey responses (cf. Diment & Garrett-Jones, 2007). The lower response rates for Web surveys than for paper surveys in this study were consistent with those previously reported by Mertler (2003) for education personnel. Yet, regardless of whether they responded online or by paper and pencil, our participants reported the same acceptability perceptions. This invariance in responses for online and offline questionnaires is consistent with findings in McCabe et al. (2006) and divergent from those in McDonald and Adam (2003). Not only did our analyses reveal no evidence of differences in response favorability for Web and postal questionnaires, but the online responses were more consistent than the paper responses for the long survey, despite the lower Internet-based response rate.

Although, in this study, survey format did not have an impact on acceptability perceptions, follow-up analyses revealed systematic differences in responses related to survey length. Individuals who responded to the long version of the survey reported more favorable perceptions of school teams, once variation due to gender, age, and survey mode was removed. Given that the long survey requested responses to 71 items, over three times the length

of the 20-item survey, we conjecture that the respondents who invested the additional effort for the long survey were more motivated to share their views and more committed to the topic of school teams than were their short-survey counterparts. Hence, their greater enthusiasm for the survey topic resulted in higher ratings.

Strengths and Limitations

A prominent strength of this study is its use of random sampling and random assignment of participants to treatment conditions. In contrast with much research, we solicited the participation of a large national sample of active professionals, rather than relying on university-based convenience samples or professionals-in-training.

It is unfortunate that we lacked complete demographic information about the sample initially invited to participate. Insofar as our sample was randomly selected, the higher proportion of females and the younger mean age of the respondents suggest an overall response bias for the survey. However, because our sample represented nearly 6% of the population of psychologists currently employed in U.S. schools, probabilistically, our reliance on random assignment is adequate to ensure demographic equivalence across the four treatment groups.

A second limitation pertains to the use of group e-mail invitations to participate in the online version of the survey. Although our electronic invitations were sent in groups of 10 or fewer, in an effort to avoid triggering recipients' electronic spam filters, the effectiveness of this small-group approach for avoiding spam filters is undetermined. Sending the electronic invitations one at a time might have constituted a more reliable procedure for avoiding spam filters.

Future Directions

In this investigation, the response rate for Web surveys was smaller than that for paper surveys. Yet in fact, the Web response rate was even lower than is readily apparent, due to the fact that the participants were selected from among individuals who had provided e-mail addresses on their organization's Web site. Future studies would do well to compare the Web survey response rates of individuals who do not provide e-mail addresses with those who do.

Conclusions

Online and paper survey modes do not necessarily produce comparable results. Survey researchers should take care to conduct prior investigations of the computer habits and demographics of their target audiences when considering the use of online or offline survey administration. For some populations, such as professional educators employed in primary or secondary schools, it may be advisable to rely on paper-and-pencil questionnaires for all participants. Alternatively, participants may be offered a choice between online and paper-and-pencil survey formats.

AUTHOR NOTE

K.C. is now at Waukegan Public Schools, Waukegan, Illinois. The authors acknowledge with appreciation the statistical assistance and guidance provided by David N. Yetter of Kansas State University. Correspondence:

dence concerning this article should be addressed to G. Yetter, School of Applied Health and Educational Psychology, Oklahoma State University, Stillwater, OK 74078 (e-mail: georgette.yetter@okstate.edu).

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