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The Length of Responses to Open-Ended Questions

A Comparison of Online and Paper Questionnaires in Terms of a Mode Effect

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The existence of a mode effect is assessed using data from two matched groups of 15- to 16-year-olds ($n = 466$) who completed a questionnaire either as a Web-based online version or an "optical mark recognition" paper version. This article focuses specifically on the length of answers to four open-ended questions included in the questionnaire. It was found that although the online answers to three of the four questions tended to be slightly longer than those from the paper version, the differences were not statistically significant. Other factors, specifically gender and educational aspirations, appeared to have much more influence on the length of answers to open-ended questions than the mode of delivery per se. The findings do not provide conclusive evidence of any mode effect with respect to the online delivery of questionnaires.

Keywords: *mode effect; online questionnaires; web-based surveys; text data; data quantity*

Introduction

Use of online questionnaires is proliferating. This reflects the advantages that online surveys have in terms of costs, geographical coverage, and speed of delivery relative to the delivery of paper versions of questionnaires by mail or other means (Dillman, 2007).

Online surveys can have their disadvantages as well, and these have been explored primarily in terms of response rates and the techniques that might be employed to avert problems arising from coverage error, sampling error, and nonresponse error (e.g., Couper, Tourangeau, Conrad, & Crawford, 2004; Couper, Kapteyn, Schonlau, & Winter, 2007; Deutskens, de Ruyter, & Wetzels, 2006; Kaplovitz, Hadlock, & Levine, 2004; Lee, 2006; Lozar Manfreda, Bosnjak, Haas, & Vehovar, 2005; Lozar Manfreda, Vehovar, & Batageli, 2001; Porter & Whitcomb, 2003; Ritter, Lorig, Laurent, & Matthews, 2004; Ross, Mansson, Daneback, Cooper, & Tikkanen, 2005; Sills & Song, 2002). To a lesser extent, there has also been some attention given to the impact of online questionnaires on item non-completions (Boyer, Olson, Calatone, & Jackson, 2002; Brecko & Carstens, 2006; Haraldsen, Dale, Dalheim, & Hrydahl, 2002; Kwak & Radler, 2002; Schaefer & Dillman, 1998; Truell, Bartlett, & Alexander, 2002; Tourangeau, Rips, & Rasinski, 2000).

Such research on the mode effect rightly addresses the concern that any shift from the use of paper questionnaires to online questionnaires should not sacrifice the quality of data. However, relatively little attention has been given to another key facet of the quality of data

associated with online questionnaires. Research on the *substance* of the answers has not attracted anywhere near the same level of attention that has been given to response rates and the mode effect (some notable exceptions are Grandcolas, Rettie, & Marusenko, 2003; McCabe, 2004; McCabe, Boyd, Couper, Crawford, & D'Arcy, 2002; Vehovar & Lozar Manfreda, 2002). The concern has been predominantly with who responds and why, rather than what information respondents give and how much detail they supply.

When it comes to the substance of responses, however, some findings suggest that this might be affected by the nature of the question type (Smyth, Dillman, Christian, & Stern, 2006), whether the data are qualitative or quantitative (Etter, 2002; Lozar Manfreda & Vehovar, 2002, Stangl, 2004), and whether the questions are fixed-choice or open-ended (Reja, Lozar Manfreda, Hlebec, & Vehovar, 2003). The type of question and the allowed format of the response, in other words, might have a significant impact on the quality and quantity of the answer. Indeed, there is some evidence that open-ended questions in online surveys produce responses that are longer, more detailed, and more revealing than comparable questions in paper-based postal surveys (Deutskens et al., 2006; Kwak & Radler, 2002; MacElroy, Micucki, & McDowell, 2002; Sturgeon & Winter, 1999; Taylor, 2000; Willke, Adams, & Girnius, 1999). Schaefer and Dillman (1998), for instance, found on the basis of their research that those completing the questionnaire via e-mail tended to provide an average of 40 words in response to open-ended questions compared with just 10 words from those completing the mailed version of the questionnaire.

However, there is not unanimity on the point. On the basis of findings from a large-scale online survey, Reja et al. (2003) sound a cautious note about the value of using open-ended questions. They found that open-ended questions tended to suffer higher rates of item noncompletion and produced an added diversity of responses compared with closed-ended questions. They warn about the need for careful attention to the precision of the wording of open-ended questions to avoid them leading to "more inadequate answers" (p. 159). Stangl (2004), in a similar vein, concludes that some online participants might be "less thorough" in their answers.

The research reported in this paper contributes to the debate covering responses to open-ended questions and the mode effect that might potentially be linked with the use of online questionnaires. Specifically, the analysis of responses to open-ended questions provided in this article looks at the length of answers (as measured by the number of words) provided by two matched groups of respondents: one group using paper questionnaires and the other using online questionnaires. It builds on an analysis of the quantitative data produced by comparable paper and online questionnaires (Denscombe, 2006) by focusing on the *text data* produced by the two modes of delivery, and specifically it considers whether respondents complete text-based answers more or less fully depending on the mode of delivery used. In essence, it addresses the question of whether there is a significant difference between paper and online questionnaires in terms of the respondents' willingness to provide information in the text boxes.

Method

A survey was conducted that involved the random allocation of respondents into two groups who then completed a questionnaire either as a web-based online version or in an

“optical mark recognition” (OMR) paper format. The research was designed to enable near-identical groups to respond to near-identical questionnaires delivered in different modes.

The survey was conducted in July 2005. It was part of the Perceptions of Social Issues (PSI) project, which, among other things, investigated the health-related behavior of young people. Specifically, the survey focused on the use of tobacco and alcohol by 15- to 16-year-olds and the way this was associated with young people’s self-identity and their perceptions of risk.

The survey covered all year 10 students in two schools in Leicestershire, United Kingdom. It produced 466 responses of which approximately 40% were online questionnaires ($n = 190$) and 60% were paper questionnaires ($n = 276$). Students and their parents were given written notification about the research project in which they were assured that participation was entirely voluntary and that they had a right to withdraw at any time. They were also informed that the questionnaires were anonymous and that all responses would be treated in the strictest confidence. Information about the project and the researchers was provided and attention was drawn to the project’s web site address at which the general findings from the research would be made publicly available. In the event, there was a full response rate with none of the students declining to participate and no pupils being withdrawn from the research by parents.

Students completing the paper and online versions of the questionnaire shared a very similar profile in terms of key demographic features such as age, sex, ethnicity, academic ability, computer expertise, and area of residence. Students were assigned to complete the paper or the online version of the questionnaire on the basis of existing class groups. These class groups were of mixed ability and they were allocated to the online or paper versions on a random basis. Both samples, therefore, might be expected to be representative with respect to the range of academic ability in the school. Allocation on the basis of class groups also meant that the students themselves were not able to elect for one kind of questionnaire in preference to the other. In terms of gender, school A had slightly more male than female respondents (male = 54.2%, female = 45.8%) whereas in school B the opposite was true (male = 46.1%, female = 53.9%). Overall, however, there was no statistically significant difference relating to the gender of the respondents at each school or the type of questionnaire completed (see Table 1). In terms of ethnicity, the number of non-White students in the survey was very low and no meaningful test of statistical significance could be applied. In school A, 95% of students classified themselves as White; in school B, the figure was 96.5%.

The two versions of the questionnaire were designed to be as similar as possible. In terms of content, the wording and sequence of questions was identical, and the online questionnaire had multiple questions on each page. Visually, they adopted the same layout as far as possible. The online questionnaire did not make use of pull-down menus or flash buttons and was deliberately designed using only basic HTML radio buttons, check boxes, and text boxes. Like the paper version, the online questionnaire was monochrome—black text on white background. Importantly, too, the online questionnaire did not make use of the “forced answer” option. Online respondents were as free as their paper questionnaire counterparts to skip over questions and leave specific items in the questionnaire incomplete. With respect to the open-ended questions, the OMR format of the paper questionnaires did not involve the need for respondents to complete open-ended questions in capital letters that had to fit in uniformly spaced boxes. The respondents could fill in open text boxes freehand.

Table 1
Type of Questionnaire by Gender

	Male	Female	Total
Paper	137 (59.8%)	139 (59.9%)	276
Online	92 (40.2%)	93 (40.1%)	185*
Total	229 (100%)	232 (100%)	

* Five respondents did not answer this question.

Table 2
Type of Questionnaire by School

	School A	School B	Total
Paper	129 (62.6%)	147 (56.5%)	276
Online	77 (37.4%)	113 (43.5%)	190
Total	206 (100%)	260 (100%)	

Questionnaires were completed either in classrooms or computer labs. The number of available computer labs in each school imposed a practical constraint here but, as Table 2 indicates, a fairly close balance was obtained in terms of both the overall numbers and the proportion of the two versions of the questionnaire completed; any differences were not statistically significant ($p = .218$).

The existence of any mode effect might be discernable through the amount of text data respondents feel inclined to supply. For this reason, the questionnaires were compared in terms of length of the text entry supplied. The data used in this article are based on responses to four open-ended questions that required respondents to provide written, text-based answers rather than selecting from a range of limited-option answers. These were interspersed amongst closed-ended questions and did not appear consecutively. Findings were calculated on the basis of only those who responded, and did not incorporate those who made no attempt to complete the question. By excluding such nonrespondents—eliminating from the calculation those who were apparently inclined not to respond at all—a comparison of means is more likely to reflect any mode effect on the volume of information supplied by those who were not only willing to answer the specific question, but who were also willing to engage in the task of supplying an answer in a text-based format. The issue, best construed, is whether *these* people might be influenced by the mode of questionnaire in terms of *how much* detail they supply.

Findings

Comparison of the number of words that respondents used for completing Question A did not reveal any marked contrast between the two modes of questionnaire delivery. Among the 443 responses to this item, the mean number of words per entry for the paper questionnaires

Table 3
Length of Answers (Number of Words)

	Question A		Question B		Question C		Question D	
	Paper	Online	Paper	Online	Paper	Online	Paper	Online
Mean	13.6	13.0	13.3	14.5	8.5	8.8	5.5	6.5
Median	12.0	11.0	12.0	13.0	7.0	6.0	4.5	4.0
Mode	12.0	2, 11	15	14	2	1	1	1
<i>SD</i>	8.8	9.9	8.1	9.7	7.8	9.2	4.7	7.0
Minimum	1	1	1	1	1	1	1	1
Maximum	68	66	65	50	56	48	32	35
Range	67	65	64	49	55	47	31	34
Skewness	1.78	1.68	1.86	1.06	2.81	2.03	2.50	1.95
Kurtosis	7.19	5.02	7.3	1.35	12.52	4.69	9.64	3.66
	<i>n</i> = 262	<i>n</i> = 181	<i>n</i> = 236	<i>n</i> = 176	<i>n</i> = 133	<i>n</i> = 93	<i>n</i> = 136	<i>n</i> = 93

was 13.6, compared with that for the online questionnaires which was 13.0. Independent samples *t*-test revealed the difference between the means was not statistically significant ($p = .506$). With outliers removed, excluding those four paper and four online responses to this item of 40 or more words, the difference in means was still not statistically significant ($p = .173$). The range of responses was very similar with the paper and the online questionnaires having a range from a minimum of 1 word to a maximum of 68 and 66 words respectively. The similarity was further evident in the fact that both sets of questionnaires included four responses on this item that were more than 40 words in length. The profile of the distribution of responses was quite similar, with skewness scores of 1.78 and 1.68.

Responses to Question B revealed a fairly similar profile for both modes of questionnaire. On this item, the average (mean) number of words per text entry for the paper questionnaires was slightly lower than for the online version (13.3 compared with 14.5), but use of the *t*-test revealed the difference between the means was not statistically significant ($p = .198$). Removing outliers did not alter this. Excluding those three paper and four online responses of 40 or more words, the difference in means was still not statistically significant ($p = .261$). As Table 3 shows, the range of word lengths was somewhat greater for paper questionnaires but this largely reflects the effect of one specific outlier. In general, the distribution of responses tended to be slightly wider in the case of online questionnaires than the paper version (as indicated by their respective standard deviations).

As with the previous two items, responses to Question C revealed no profound differences to suggest a mode effect in relation to the paper and online versions of the questionnaire. The mean number of words was similar (8.8 and 8.5 respectively for paper and online) and independent samples *t*-test analysis revealed the difference between the means was not statistically significant ($p = .825$). With outliers removed, excluding those three paper and five online questionnaire responses of 30 or more words, the difference in means was still not statistically significant ($p = .482$). Echoing the situation with Question B, although the range of responses might appear to be greater in the case of the paper questionnaires (see Table 3), this reflected the influence of two particular outliers (answers of

56 words and 44 words, with the next largest response being just 29 words). If anything, as the standard deviations suggest (Table 3), there was a slightly wider distribution in the case of online questionnaire responses compared with paper questionnaire responses.

The profile of responses to Question D was largely in line with the other questions. The mean number of words for this item was slightly larger for the online version of the questionnaire (see Table 3) but the use of the *t*-test again revealed that the difference between the means was not statistically significant ($p = .214$). Removing outliers did not alter this. Excluding those two paper and nine online questionnaire responses of 20 or more words, the difference in means was not statistically significant ($p = .284$). The range of the responses was similar (32 compared with 35) although the standard deviations (see Table 3) suggest that the distribution of responses was somewhat wider in the case of the online questionnaires.

Discussion

The data did not provide any firm support for the idea of a mode effect influencing the length of answers to open-ended questions. Although online questionnaires appeared to correlate with slightly longer answers to open-ended questions in three of the four items, the difference was neither substantial nor statistically significant. And indeed, as Table 3 indicates, when average response lengths are looked at in terms of modes and medians (rather than means) there is no clear overall relationship evident from the data. Such a conclusion is reinforced by the fact that the size of the effect of the questionnaire mode, calculated on the basis of eta squared, was found to be extremely small. For each of the four questions, the amount of variance in the word-length of answers that could be attributed to the questionnaire mode was considerably less than 0.1%.

By comparison, the *gender* of the respondents seemed to be a much more influential factor affecting the number of words per answer to open-ended questions. As Table 4 indicates, there was a clear statistically significant difference with females tending to give longer answers. The difference is quite marked—in the order of 38%, 52%, 35%, and 26% more words from females than from males for questions A to D respectively.

Gender turned out to be the most important predictor of the length of answers when included in a model with other potential factors including educational intentions, use of computers at home, and questionnaire mode (paper or online). Familiarity with computers was included in the model to accommodate the possibility that regular users of computers might be better able to exploit the technology involved in online questionnaires. About one third of the respondents in the survey reported using a personal computer at home for more than 1 hr a day on average. Such people might be expected to represent those who were comfortable with computer use and, in particular, the entry of data using the keyboard. As Table 5 shows, those who used computers at home for more than 1 hr a day did indeed tend to provide longer answers. On all four questions, the mean word count was higher for this group. The difference, however, was not great and it was only in connection with Question D that there was a statistically significant difference ($p < .05$). This item, as it happens, was answered less frequently than the others and had generally shorter answers than the others.

Educational aspirations were included in the model to take on board the possibility that providing longer answers might be a reflection of being more comfortable with the use of the written word and with confidence in expressing thoughts using the written word. As a

Table 4
Length of Responses (Word Count) by Gender

	Gender	<i>n</i>	Mean	<i>SD</i>	Mean difference	Significance (2-tailed)
Question A	male	199	11.56	6.9	4.37	0.000
	female	211	15.93	10.0		
Question B	male	213	10.54	6.9	5.49	0.000
	female	227	16.03	10.4		
Question C	male	119	7.45	7.7	2.60	0.020
	female	105	10.05	8.9		
Question D	male	126	5.29	4.6	1.37	0.088
	female	102	6.66	6.9		

Table 5
Length of Responses (Word Count) by Amount of Computer Use at Home

	Amount of computer use	<i>n</i>	Mean	<i>SD</i>	Mean difference	Significance (2-tailed)
Question A	< 1 hour a day	274	13.73	8.5	0.4	0.664
	> 1 hour a day	133	14.14	9.7		
Question B	< 1 hour a day	297	12.91	8.6	1.7	0.071
	> 1 hour a day	141	14.62	10.3		
Question C	< 1 hour a day	147	8.31	8.1	1.1	0.343
	> 1 hour a day	75	9.44	9.0		
Question D	< 1 hour a day	155	5.28	4.7	2.0	0.037
	> 1 hour a day	71	7.28	7.2		

proxy for this notion, the data were analyzed in terms of the respondents' stated aspirations with regard to formal education; whether they intended to leave formal full-time education at the age of 16+, 18+, or 21+. Those expressing an intention to stay in full-time education until the age of 18+ or 21+ might perhaps be expected to be more at ease with use of the written word for self-expression than those planning to leave earlier at 16+. Independent sample *t*-tests revealed that the length of the answers did indeed vary with educational intentions: The longer respondents expected to stay in full-time education, the longer their answers. The 21+ group gave the longest answers, with the 18+ group not far behind. The 16+ group tended to give distinctly shorter answers. The difference was statistically significant at $p < .01$ for three of the four questions in comparisons between the 21+ and 16+ groups as well as between the 18+ and 16+ groups. The 21+ group provided longer answers than the 18+ group on three of the four questions, but the differences were small and none were statistically significant at the $p < .05$ level (see Table 6).

Multiple regression analysis indicated that gender was the best predictor of the length of the answers—clearly the case in relation to Questions A, B, and C ($p < .01$). Educational intention was also found to be a fairly good predictor, as was use of the computer at home. By contrast, questionnaire mode proved to be the weakest predictive factor with two of the four questions, and was never the most significant factor.

Table 6
Length of Responses (Word Count) by Educational Intentions (Age at Which Respondents Envisaged Leaving Full-Time Education)

	Age	Mean	SD	<i>n</i>
Question A	16+	10.60	6.204	108
	18+	13.91	9.191	167
	21+	15.42	10.565	161
Question B	16+	10.53	7.134	98
	18+	14.21	8.266	157
	21+	14.76	10.011	153
Question C	16+	7.53	5.840	55
	18+	8.60	8.449	78
	21+	9.12	8.883	89
Question D	16+	3.91	3.318	55
	18+	6.75	6.984	80
	21+	6.47	5.545	89

Conclusion

The findings hint at the possibility that online questionnaires might, all things being equal, produce slightly longer responses to open-ended questions than their paper-based counterparts. However, the observed difference between the two modes was not always consistent and was not generally large enough to be considered statistically significant. Bearing these points in mind, the findings from this research do not provide firm evidence of any difference in the length of responses produced by the two alternative modes of questionnaire delivery. Other factors, specifically gender and educational intentions, appeared to have much more influence on the length of answers to open-ended questions than the mode of delivery *per se*. This has some more general implications. To the extent that online questionnaires were *not* found to have any significant impact on respondents' answers (relative to traditional paper questionnaires), the findings from this research do nothing to impugn the reliability of online data-collection methods. Indeed, the findings from this research provide some methodological reassurance to those taking advantage of the low cost and high speed associated with online surveys.

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