

Article

8 cYg'H Y'Zfgh]a dfYgg]cb'Wci bhB'
9I Ua]b]b['h Y'YZZWicZH Y'k YWca Y'
gWYYb'XYg]] b'cb'h Y'fYgdcbgY'fUhY

by Roos Haer and Nadine Meidert

January 2014



How to obtain more information

For information about this product or the wide range of services and data available from Statistics Canada, visit our website, www.statcan.gc.ca.

You can also contact us by

email at infostats@statcan.gc.ca,

telephone, from Monday to Friday, 8:30 a.m. to 4:30 p.m., at the following toll-free numbers:

- | | |
|---|----------------|
| • Statistical Information Service | 1-800-263-1136 |
| • National telecommunications device for the hearing impaired | 1-800-363-7629 |
| • Fax line | 1-877-287-4369 |

Depository Services Program

- | | |
|------------------|----------------|
| • Inquiries line | 1-800-635-7943 |
| • Fax line | 1-800-565-7757 |

To access this product

This product, Catalogue no. 12-001-X, is available free in electronic format. To obtain a single issue, visit our website, www.statcan.gc.ca, and browse by "Key resource" > "Publications."

Standards of service to the public

Statistics Canada is committed to serving its clients in a prompt, reliable and courteous manner. To this end, Statistics Canada has developed standards of service that its employees observe. To obtain a copy of these service standards, please contact Statistics Canada toll-free at 1-800-263-1136. The service standards are also published on www.statcan.gc.ca under "About us" > "The agency" > "Providing services to Canadians."

Published by authority of the Minister responsible for
Statistics Canada

© Minister of Industry, 2014.

All rights reserved. Use of this publication is governed by the
Statistics Canada Open Licence Agreement ([http://www.
statcan.gc.ca/reference/licence-eng.html](http://www.statcan.gc.ca/reference/licence-eng.html)).

Cette publication est aussi disponible en français.

Note of appreciation

Canada owes the success of its statistical system to a long-standing partnership between Statistics Canada, the citizens of Canada, its businesses, governments and other institutions. Accurate and timely statistical information could not be produced without their continued co-operation and goodwill.

Standard symbols

The following symbols are used in Statistics Canada publications:

- | | |
|----------------|--|
| . | not available for any reference period |
| .. | not available for a specific reference period |
| ... | not applicable |
| 0 | true zero or a value rounded to zero |
| 0 ^s | value rounded to 0 (zero) where there is a meaningful distinction between true zero and the value that was rounded |
| ^p | preliminary |
| ^r | revised |
| X | suppressed to meet the confidentiality requirements of the <i>Statistics Act</i> |
| E | use with caution |
| F | too unreliable to be published |
| * | significantly different from reference category (p < 0.05) |

Does the first impression count? Examining the effect of the welcome screen design on the response rate

Roos Haer and Nadine Meidert¹

Abstract

Web surveys are generally connected with low response rates. Common suggestions in textbooks on Web survey research highlight the importance of the welcome screen in encouraging respondents to take part. The importance of this screen has been empirically proven in research, showing that most respondents breakoff at the welcome screen. However, there has been little research on the effect of the design of this screen on the level of the breakoff rate. In a study conducted at the University of Konstanz, three experimental treatments were added to a survey of the first-year student population (2,629 students) to assess the impact of different design features of this screen on the breakoff rates. The methodological experiments included varying the background color of the welcome screen, varying the promised task duration on this first screen, and varying the length of the information provided on the welcome screen explaining the privacy rights of the respondents. The analyses show that the longer stated length and the more attention given to explaining privacy rights on the welcome screen, the fewer respondents started and completed the survey. However, the use of a different background color does not result in the expected significant difference.

Key Words: Web surveys; Welcome screens; Breakoffs; Design.

1 Introduction

With the growing number of internet users and the increasing popularity of broader bandwidth, the use of Web surveys to collect data is proliferating at a rapid pace (Vicente and Reis 2010). The advantages of this survey mode have been well documented; they save a significant amount of time and money. Along with the positive aspects of Web surveys, there are methodological concerns that cannot be ignored if survey quality is to be guaranteed (Vicente and Reis 2010). These concerns are mainly about nonresponse and coverage. Although coverage is of less concern for surveys of specifically named persons, such as students, nonresponse remains a major concern in Web survey research (Crawford, Couper and Lamias 2001).

Web surveys are connected with relatively low response rates compared to other modes of survey research (Lozar Manfreda, Bosnjak, Berzelak, Haas and Vehovar 2008). It affects all types of Web surveys, from list-based samples to pre-recruited probability-based panels and opt-in or volunteer panels (Couper and Miller 2008, page 833). The nonresponse rate is the sum of those respondents that did not participate in the Web survey, although they were invited, together with those respondents that broke off and dropped out prematurely. In other words, nonresponders are those respondents who do not view all questions and answer all questions (Bosnjak and Tuten 2001). It is important to note that we use the terms 'dropout' and 'breakoff'; as synonymous throughout this study. Nonresponse is of particular importance to researchers because the unknown characteristics and attitudes of non-respondents may cause inaccuracies in the results of the study in question (Bosnjak and Tuten 2001). This problem poses a challenge for any survey mode, but in particular to Web surveys (Galesic 2006). In general, dropout rates

1. Roos Haer and Nadine Meidert, Department of Political Science and Public Administration, University of Konstanz, Universitätsstraße 10, 78464 Konstanz, Germany. E-mail: Roos.vanderHaer@uni-konstanz.de, Nadine.Meidert@uni-konstanz.de.

in Web surveys may be as high as 80 percent, with an average of about 30 percent. For individually targeted Web surveys, these rates are lower, but still average at about 15 percent (Galesic 2006, page 313; Peytchev 2009).

By far, the largest number of respondents who drop out do so on the initial page – the welcome screen (Couper 2008). On this splash screen, the invitee is reassured that they have arrived at the right place, is informed about the content of the survey, (given the country context) privacy rights, and encouraged to proceed to the survey itself. Consequently, this particular page plays an important role in sealing the deal; in turning the invitee into a respondent (Couper 2008, page 330). However, despite its importance, the influence of the welcome screen on breakoff rates has received little to no research attention (Couper 2008, page 330).

This is even more surprising, considering the rich multimedia capabilities of Web surveys that allow text to be supplemented with a variety of visual elements, such as color, graphics, typography, and animation. Experimental research has shown that the content of the text as well as these auxiliary features are potentially powerful tools for maintaining respondents' interest in the survey and for encouraging completion of the instrument (Couper, Traugott and Lamias 2001). Although respondents are exposed to these design features from the very first screen that they see, most of the conducted experimental survey research has been limited to the influence of the design of the actual complete survey on breakoff rates and not to the influence of specific lay-out and design features of the welcome screen.

With this in mind, the goal of this study is to systematically explore some of the factors connected to the welcome screen that may affect the decision to break off the survey prematurely. As such, this research falls into the category of research focused on how to increase response rates (Bosnjak and Tuten 2001). In identifying these factors, special attention is devoted to the use of color, the announced length of the survey, and to variations in describing the privacy rights of the respondent. These three factors are standard elements of the welcome screen often discussed in textbooks, but neglected in empirical research.

The remainder of the article is structured as follows. Firstly, empirical evidence is used from Web surveys to develop our hypotheses about the influence of particular design features of the welcome screen on the breakoff rates. Next, we describe the experimental study we conducted aiming to test these hypotheses. Finally, we conclude this article with a discussion and implications for Web survey design.

2 Theoretical background

One of the most prevalent threats to Web surveys inference is breakoffs or so-called dropouts. These are respondents that quit prior to completing the survey (Bosnjak and Tuten 2001). Breakoff, as a part of the nonresponse rate, can harm the quality of survey statistics; the larger this rate, the larger the risk of nonresponse error. As a result, much effort of survey researchers has been focused on reducing this rate (Groves *et al.* 2004). Within the Web survey methodology literature, most research on how to improve data quality by reducing this rate is focused on the use of follow-ups, incentives, length, wording, and presentation of the questionnaire (Deutskens, Fowler, Couper, Lepkowski, Singer and Tourangeau 2004, page 22). Most of these response-enhancing features focus on making changes in the content and its lay-out. To our knowledge, limited attention has so far been given to guidelines concerning the lay-out and wording of the welcome screen. For example, Dillman's (2007, page 377) recommendation on how to

construct an effective welcome screen only highlights that this particular page has to be motivational, emphasizing the ease of responding, and should instruct the respondents about how to proceed to the next page. Detailed and practical instructions on how to design an effective welcome screen are lacking. This is surprising because most respondents drop out after the first screen (*i.e.*, the so-called unit nonresponders) (Couper 2008; Bosnjak and Tuten 2001). Moreover, this particular splash screen provides the potential respondent with a first impression of the survey: it evokes emotions towards the questionnaire that might induce respondents to not only start with the Web survey, but also to provide answers faster, to overlook imperfections of the design, and perhaps even answer more honestly (Dillman, Gertseva and Mahon-Haft 2005). Furthermore, it is a question of aesthetics as visual traits determine an individual's feelings and emotional reaction. In Web surveys, the welcome screen is the first visual contact to the respondent and thus its lay-out impacts the respondents' feelings toward the whole survey. It can be even assumed that an appealing survey design can distract from the bad quality of the questionnaire itself (Mahon-Haft and Dillman 2010).

To fill this niche in empirical research, we test three potential factors embedded on the welcome screen on the breakoff rates of a Web survey. These factors are; the use of background color, the number of words devoted to explaining the privacy rights and the data security to the potential respondent, and the announced length of the Web survey. These three elements of the welcome screen are chosen because they are not only essential elements of welcome screens, they also influence the first impression respondents might get of the survey.

2.1 Background color

Unlike paper surveys, the use of the Web opens a batch of visual possibilities. This visual potential is of importance since respondents attend to many features of survey questions not just the words that convey the question or the literal meaning of those words (Tourangeau, Couper and Conrad 2007). These nonverbal features compromise numeric, symbolic, and graphic language (Redline and Dillman 2002; Dillman 2007). Because numbers or symbols are hardly ever used in designing effective welcome screens, the graphical non-verbal element (*i.e.*, brightness, size, shape, spatial arrangement, contrast, figure/ground, and even color) might play an important role in increasing response rates.

With the flexibility of the Web, it is, for example, simple for the designer of the survey to create text and background combinations of a variety of differing colors (Hall and Hanna 2004). As a result, myriad of different color combinations proliferate Web surveys. The choice of a particular color relates to the visual contrast of the verbal information presented on the colored background. This is partly determined by their wavelengths. For example, saturated colors have different wavelengths that need to be focused at different depths behind the lens of the eye, which lead to visual fatigue (Couper 2008, page 164). In addition, research has shown that respondents tend to find short wavelength colors (blues and greens) more pleasant than long wavelength colors (reds and yellows) (Hall and Hanna 2004). For example, Pope and Baker (2005) varied the background color of a survey of college students, using blue or pink background for a survey on alcohol-related issues. The survey with the blue background took less time to complete (although the differences were not statistically significant).

Besides wavelength, colors also may direct communication in other ways. Color has meaning, whether through cultural conventions, learned associations, or the actions associated with color in the instrument

itself (Couper 2008, page 168). That is to say, color can affect respondents emotionally. The color red, for example, is often associated with danger or hotness, especially when linked with blue for cold (see for example, Gorn, Chattopadhyay, Yi and Dahl 1997). A few studies have focused on user emotions when filling out colored Web surveys. Weller and Livingston (1988) for example, found out that the color of the questionnaire did indeed affect the received responses. Specifically, the color pink produced less emotional response than the color blue.

Some studies have been conducted on the influence of color on response rates. For example, Etter, Cucherat and Perneger (2002) concluded in their meta-analysis of 10 experimental studies, that printing questionnaires on colored paper does not substantially influence the speed of response or the proportion of missing items. More importantly, when all colors (blue, green, or yellow) were pooled, no study in the meta-analysis found a statistically significant effect of colored paper (versus white paper) on response rate. The only color that had some minor effect (in comparison to white) was pink. Also the studies that have been conducted to examine influence of color in self-administered Web surveys on response rates show that background color may have some effect, although not in all cases and not always a very large effect (Couper 2008). Dillman, Conradt and Bowker (1998) and Hall and Hanna (2004) for example, show in their studies that a design of black letters on a white background is the most effective design concerning response rates. This is also confirmed with a recent meta-analysis for mail surveys conducted by Edwards, Roberts, Clarke, Diguiseppi, Wentz, Kwan, Cooper, Felix and Pratap (2009). They found that the odds of response were increased by a third using a white background. Extending this argument to the usage of color on welcome screens, we expect that the group of respondents receiving a welcome screen consisting of colors with long wavelengths that boast negative emotional response, will have a higher breakoff rate than the group of respondents receiving a simple welcome screen without many colors.

2.2 Privacy rights

One of the possible explanations for why Web surveys are troubled with low response rates compared to other modes of survey research, may relate to confidentiality concerns with respect to electronic mail and to the Web in general (Couper 2000). Although self-administered Web surveys have the ability to collect sensitive information with less desirability bias, concerns about the security of the Web may negate this benefit, potentially producing higher nonresponse rates (or less honest reporting).

It is therefore not a surprise that most Web survey researchers, depending on the legal regulations of their country, provide their potential respondents with information on what will be done with the information they give. In addition, they emphasize the voluntary aspect of the survey and often assure that they will never match respondent's names with the results in any way. These rights to privacy of respondents are not only mentioned in the invitation e-mail but also on the welcome screen. The welcome screen also plays an important part in reassuring respondents and motivating them to start the Web survey.

A few studies have examined how assurances of privacy and confidentiality have an effect on the response rate. Most of the early studies concerned the U.S. household decennial census and were based on the assumption that privacy assurances were a 'good' thing - it increases response rates by overcoming respondent's concerns (Singer, Hippler, and Schwarz 1992, 258; Singer, Von Thurn, Miller 1995, 66-67). However, these early studies show the contrary; these assurances reduced the willingness to participate (Fay, Bates, and Moore 1991; Singer, Mathiowetz, and Couper 1993; Singer, Van Hoewyk, and

Neugebauer 2003; Hillygus, Nie, Prewitt and Pals 2006). For example, Singer *et al.* (1992) demonstrated that mentioning privacy rights negatively affects response, whether measured as item nonresponse, unit nonresponse, response rate, or response quality. These studies uncovered unanticipated consequences. Assurances of confidentiality and privacy protection rights might actually increase participants' concerns about the survey content. These assurances seem to change respondents' perception of the threat of the survey: they suggest that it might contain unpleasant, difficult or even embarrassing questions. In other words, these guarantees result in a priming response effect, *i.e.*, it activates the concept of confidentiality and privacy rights in the respondent's memory, which is then given increased weight in the subsequent decision to participate or not. Extending this to the issue of mentioning the privacy rights on the welcome screen, we expect that the more words researchers use to explain these rights, the more likely potential respondents become aware of possible problems with the issue, and the less likely they will start the Web survey. However, we have no clear expectations concerning the influence of stressing the privacy rights on the breakoff rates during the Web survey.

2.3 Announced length

The decision to fill out a Web survey and to carry it out till the end is to a great extent influenced by the effort required of the respondent (Vicente and Reis 2010). This is partly determined by the perceived length of the survey (Bradburn 1978). Common sense tells us that longer surveys increase the perceived costs of participation and make it more likely that people will break off the survey prematurely.

Several studies have examined the effect of questionnaire length on response rates in Web surveys with mixed result. The meta-analysis conducted by Cook, Heath and Thompson (2000) for example, found no significant correlation between questionnaire length and response rates in Web surveys. However, questionnaire length was found to affect response rates in subsequent studies (Vicente and Reis 2010, page 256). For example, Deutskens *et al.* (2004) and Ganassali (2008) affirmed that the breakoff rate was higher in the long version of their Web survey than in the short version. Also Marcus, Bosnjak, Linder, Pilishenko and Schütz (2007) tested the relationship between the length of the Web survey and response rates in a field experiment. They found a significant effect: 30.8% responded to the short survey but only 18.6% to the longer one. This strong effect was significant throughout several other models in which they control for alternative explanations, such as the salience of the survey topic or the use of incentives.

A related issue is the announcement *a priori* of questionnaire length. The relationship between this announcement and the response rate has, however, more to do with the perception of the length than with the actual length of the survey. The announced length is also an indicator of the respondent's perceived burden and influences the decision to participate and to continue to participate. A few studies have experimented with this announcement. For example, Crawford *et al.* (2001) conducted an experiment to evaluate whether the previous announcement of questionnaire length would affect the percentage of people who begin the survey and whether breakoffs would be higher when the survey took longer than the promised completion time. As hypothesized, the authors found that respondents who were informed that the survey would take only eight to ten minutes to complete had a lower overall nonresponse rate than those who were told it would take 20 minutes. However, the 20-minutes group had a lower rate of breakoffs once they started the survey. These results are also found in other studies, such as those of Hogg and Mill (2003), Baker-Prewitt (2003), and of Galesic (2006).

The literature on the effect on the announced length on the response rates is closely related to the discussion on the advantages and disadvantages of using a progress indicator (see for example, Galesic and Bosnjak 2009; Heerwegh 2004). Yan, Conrad, Tourangeau and Couper (2010) for example, found that the effect of the progress indicators depend on respondents' expectations and the degree to which they were realized; the presence of a progress indicator led to fewer breakoffs when respondents expected a short task based on the invitation and when the questionnaire was indeed shorter when they expected the task to be longer.

In accordance with Crawford *et al.* (2001) and unlike the other two possible design factors, we expect that the announced length of the survey on the welcome screen influences not only the initial nonresponse but also the breakoff rate later in the survey. To be more precise, we expect that fewer respondents will start a Web survey when the announced length on the welcome screen is longer. In addition, these respondents are less likely to drop out once they have started since the real length of the survey will hardly exceed the perceived duration.

3 Research design and implementation

The experiments we describe here were included in a survey of University of Konstanz first year Bachelor and Master students conducted by the quality management unit of the university. This unit was interested in why students choose to study in Konstanz. We designed the questionnaire in close cooperation with the quality management unit, whereas the various designs of the welcome screen were conceptualized solely by us.

The different designs of the welcome screen were added after the content of the study was determined. We tested the three features in a 2 x 2 x 2 experimental design. Table 3.1 gives an overview of the control and treatment groups. See Appendix A for an example of one of the six possible welcome screens.

Table 3.1
Research design

		Privacy Right			
		Available via link		On the welcome screen	
		Background color			
		white	red	white	red
Announced survey duration	short (8min)	short white link	short red link	short white screen	short red screen
		long white link	long red link	long white screen	long red screen
	long (20min)	short white link	short red link	short white screen	short red screen
		long white link	long red link	long white screen	long red screen

To test the influence of background color on the likelihood of breakoff, we selected two lay-outs: one with black text on a white background and another one with black text on a red background. We are aware of the fact that the red is not a very realistic background color. Nevertheless, due to the mixed-results of

previous research, we have chosen this color as a most likely case of breakoff directly after the welcome screen. Red is a saturated color with a long wavelength. Additionally, this color might cause a negative effect on the emotional response of the respondent since it is usually used as a warning sign. However, we are acquainted with the fact that our research design cannot clearly determine which of the discussed mechanisms (*i.e.*, wavelength, saturation, or emotional response) has a possible impact. Nevertheless, we can give first insights if the color on the welcome screen is relevant at all. Note that we have verified that the display of the background colors was the same across different browsers.

To examine the effect of privacy rights on the breakoff rate, we again came up with two designs: a version in which the privacy rights were described in detail directly on the welcome screen, and another version in which the privacy rights were only briefly mentioned and respondents could use a Web link that opened a new window where their privacy rights were made clear in the same way it was done in the first version.

To test the effect of the perception of duration *i.e.*, the announced length of the Web survey on the welcome screen, we announced two different time durations needed to fill in the questionnaire. We used the result of the pretest as guidance to estimate the duration. The result of the pretest indicated that, completing the survey took on average around 12 minutes. Consequently, we decided to inform the sampled persons in one version of the survey that it would only take about 8 minutes to complete, which corresponds to the expected minimum to complete the questionnaire, whereas another group of respondents were told it would take about 20 minutes to complete. The duration to complete the survey depended to a great deal on how many answers respondents would give in the survey, since the questionnaire contained many filters. The real mean time to complete the questionnaire was 17.81 minutes (with a standard deviation of 9.01), which is considerable higher than the pretest indicated.

The invitation of the Web survey was sent to all 2,629 first year students' university e-mail accounts (See Appendix B). We focus on this particular student population since we assume that they had not been frequently exposed to Web surveys from the university and they were therefore more inclined to fill out such a survey without 'satisficing' (Toepoel, Das and Van Soest 2008). Once the students clicked on the survey link ($n = 1,419$), they were randomly assigned to one of the eight groups, with a minimum of 151 students and a maximum of 185 students in each treatment group. On average, there were around 177 students per treatment group with a standard deviation of 8.5 (see Table 4.1 for the exact number of respondents per treatment group).

Since the information provided in the invitation e-mail often overlaps with that provided on the welcome screen, we limited the instruction in the e-mail as much as possible to isolate the possible effect of the welcome screen. Furthermore, to keep the e-mail's layout as simple as possible no HTML format was used. With the invitation e-mail, the students received a unique URL in which their personal password was integrated, which prevented multiple completions of the survey. These e-mail messages inviting students to participate in the survey were sent on November 8, 2011 after having conducted a qualitative pretest with 15 individuals, who were working in the administration of the university, who were students, or who had experience with survey research. This pretest was focused on technical aspects of the survey and on the wording of the text and the questions.

Five days after the initial e-mail had been sent, a reminder was sent to those who had not participated in the survey yet. A final reminder was sent on November 18, 2011 not only to those who had not participated yet but also to those who had started but not completed the survey. The survey closed on

December 5, 2011. From the 2,629 students, 1,419 started the survey, from which 1,118 completed the entire survey. Completion of the survey means that the participant arrived at the last page. Since all important questions were implemented as forced-choice, item non-response is not relevant. These figures result in response rates of 43 percent using the *American Association of Public Opinion Research* (AAPOR) RR1 and 54 percent using AAPOR RR2 which takes partial response into account (AAPOR 2011).

The Web survey was implemented using the Unipark program, which is an online survey software allowing users to create Web surveys with minimal effort. The program allows for straightforward programming and is in comparison to other providers low priced for scientific use. Unipark is rather flexible in the different aspects. For example, participants can interrupt filling in the questionnaire and continue later. Furthermore, the system records information when participants break off or the time they need to complete the questionnaire and individual screens. In addition, it allows for integrating sophisticated and non standardized tools to the questionnaire design. Despite the increasing use of mobile devices, we did not implement a mobile webpage, which has proven to be a good decision as only 65 participants used mobile devices to fill in the questionnaire. However, these participants, although more likely to access the survey, were also more likely to break off (21 percent in the group without mobile devices and 35 percent with mobile devices, $p < 0.01$).

4 Results

Before presenting the statistical results, we first compared the shares of our sample (*i.e.*, those students that participated in the survey) with that of the population (*i.e.*, all students that received an invitation). The invitation was sent to 2,629 students, from which just over 47 percent were male. From those that participated (1,419), just over 44 percent were male. There does not seem to be a different response behavior between men and women. However, some differences are observable when comparing the different faculty departments. Whereas the Science faculty seems to be represented adequately in the sample (both the sample and the population around 30 percent), the faculty of Humanities seems to be overrepresented (43 percent in the sample, 29 percent in the population), and the faculty of Politics, Law and Economics underrepresented (25 percent in the sample, 40 percent in the population).

In Table 4.1, the breakoff rates and the absolute number of those students who participated in the Web survey are displayed per treatment group. Notice that 83 students broke off after seeing the first screen, while 218 others broke off on other pages of the Web survey (in total the overall breakoff rate is 300). This descriptive table also shows that the breakoff rates (whether directly after the welcome screen or the breakoff rate on all other pages) are generally lower for those respondents who received a welcome screen in which privacy rights were not emphasized and in which the announced length of the survey is underestimated. However, the influence of color on the welcome screen on the breakoff rates seems to be mixed.

To test whether the patterns observed in Table 4.1 are robust and statistically significant, we conducted Logit regressions with three different dependent variables. First, a dichotomous variable comprising whether the respondent broke off directly on the welcome screen (coded as 1 or 0 otherwise). Second, a dichotomous variable taking the value of 1 if the respondent broke off on any other page than the welcome

screen (otherwise coded as 0). Third, a dichotomous variable measuring whether the respondent broke off on any page of the survey (both the welcome screen and any other page, coded as 1 or 0 otherwise). However, in case of the latter measures we cannot clearly prove if the observed effect is primarily due to the welcome screen or to an interaction between the welcome screen and the whole Web survey (or particular pages).

Table 4.1
Breakoff in the different experimental groups

	Breakoff on welcome screen		Overall breakoff rate		Total respondent n per treatment group
	<i>n</i>	%	<i>n</i>	%	
White, short, link	2	1.07	35	18.72	187
White, short, screen	4	2.30	31	17.83	174
White, long, link	15	7.89	49	25.79	190
White, long, screen	18	10.40	50	28.90	173
Red, short, link	3	1.79	18	10.71	168
Red, short, screen	12	6.78	35	19.77	177
Red, long, link	13	7.10	37	20.22	183
Red, long, screen	16	9.58	46	27.54	167
Total n	83		301		1,419
Mean of n (Stand. Dev.)	10.4 (6.4)		37.6 (10.7)		177.4 (8.5)

The results of the Logit regressions are presented in Table 4.2. The second column of this table presents the effects that the different treatments have on the likelihood that respondents break off on the welcome screen. The third column shows the impact of the different treatments on the breakoff likelihood during the survey excluding those respondents that broke off on the welcome screen. The fourth column looks at the effect of the design features on the overall breakoff likelihood. We have also estimated the models including all possible interaction effects between the experimental variables. However, the results did not clearly show that a combination of various treatments consequently increases the effects. Furthermore, we also included interactions effects between the experimental variables and subgroup variables such as gender or faculty. Since unambiguous subgroup differences in effects could not be identified or the variations within the subgroups were too small to estimate the model, the results of these interactions are also not presented and discussed in the following results section where we present only the parsimonious models.

In line with previous research, we expected that those respondents who received a red welcome screen are more likely to break off than those who received a white screen. Although the positive Logit coefficient in the second column indicates that there is indeed a positive relation between the red background and having a higher level of breakoffs on the welcome screen, this relationship is not statistically significant. However, there is a statistically significant negative effect of the red welcome screen on the breakoff rate on any screen except the welcome screen, *i.e.*, the combination of the red welcome screen and the other white screens of the questionnaire seems to encourage the participants to continue. When looking at the effect of the red welcome screen on the overall breakoff rate, the coefficient presented in the fourth column of the table suggests that the color of the welcome screen has no significant effect. This observation indicates that the welcome screen, although important, is just one screen of the

Web survey. As one of our pre-testers suggested, it might be the case that the color red boasts such a negative feeling that respondents click immediately further without looking at the screen. This idea was tested with an Ordinary Least Squares (OLS) regression in which the color and the other treatments as control were regressed on the amount of time spent on the welcome screen. However, the results (available upon request) did not prove any statistical significant effect. Note that the Pseudo R square values reported for the model (and across all models) is quite low. However, this is a common result for Logit regressions analyzing experimental outcomes. For example, Marcus *et al.* (2007) report a Nagelkerke's R squared of 0.041 and Bandilla, Couper and Kaczmirekt (2012) a Pseudo R square of 0.05.

Table 4.2
Logit regression

	(1) Breakoff on the welcome screen	(2) (3) Breakoff on any page except the welcome screen	Breakoff at any time of the survey
Background color: red	0.17 (0.23)	-0.33** (0.15)	-0.20 (0.13)
Announced duration: 20minutes	1.15*** (0.26)	0.23 (0.15)	0.53*** (0.13)
Data security information: available via link	-0.52** (0.23)	-0.14 (0.15)	-0.28** (0.13)
Constant	-3.34*** (0.27)	-1.61*** (0.15)	-1.37*** (0.13)
N	1,419	1,419	1,419
Pseudo R-squared	0.04	0.01	0.02
Prob > chi2	0.00	0.05	0.00

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

We also suspected that respondents receiving a welcome screen with the announcement that the survey only takes 20 minutes were less likely to start than those who received a welcome screen on which it was stated that the Web survey would only take eight minutes. This theoretical expectation is statistically supported by a positive and statistically significant Logit coefficient of 1.15. Additionally, we assumed that those respondents that started the 'long' survey were less inclined to break off during the Web survey. However, we did not find any support for this hypothesis. The non-significant coefficient of 0.23 means that there is no significant difference of the breakoff rates on any screen except the first page between those that received an announced 'eight minute' survey and those that received the announcement that the survey would take 20 minutes to complete. In sum, the positive and significant coefficient of 0.53 in the fourth column indicates that those respondents that received a welcome screen on which it was stated that the Web survey would take 20 minutes are more likely to breakoff the survey than those respondents who received the announcement that it would only take eight minutes. Overall, the coefficients of the announced duration are the most important ones across the different models, *i.e.*, the most important factor that explains the breakoff rates is the announced length on the welcome screen. This result is in line with the study conducted by Galesic and Bosnjak (2009) who found out that the longer stated length, the fewer respondents started and completed the questionnaire.

The last design feature that we varied on the welcome screen was the amount of emphasis that was placed on the privacy rights of respondents. We expected that the more these rights were emphasized, the more respondents would become aware of possible problems with these rights, and the less likely they were willing to start the Web survey in the first place. The results of the Logit models support this idea. The negative coefficient of -0.52 indicate that when the privacy rights are explained via a link on the Web survey (only six respondents actually opened this hyperlink), *i.e.*, few words are spend on the explanation of these rights on the screen itself, the breakoff rates on the welcome screen decreases. In other words, the priming of the privacy rights on the welcome screen increases nonresponse. In addition, explaining the privacy rights more in depth on the welcome screen has also influence on the breakoff rates during the complete survey. However, we are not sure whether the decline in response rate is due to the amount of emphasis on privacy rights or because of the length of the welcome screen (explaining the privacy rights on the welcome screen resulted in a longer screen). Further research should try to distinguish these two related processes.

5 Conclusion and discussion

One of the biggest quests of Web survey designers is to get respondents to sign on to the survey site and to keep respondents motivated to complete the survey once they have begun. However, most designers have looked into the lay-out and the design of the Web survey itself, and how this affects breakoff rates. In their quest, they have paid less attention to the important role that the welcome screen plays. This initial screen of a Web survey turns the invitee into a respondent and influences their first impression of the survey. In addition, empirical research has determined that most respondents breakoff after this initial page.

The purpose of this study was to ascertain some of the factors related to the design of the welcome screen for Web surveys affecting response rates in the electronic environment. To examine this influence, we embedded a 2x2x2 design a Web survey. The findings suggest that the lay-out of the welcome screen plays an important role in communicating to the respondent. The longer the expected announced length on the welcome screen and the more emphasis is placed on the explanation of the respondent's privacy rights, the fewer respondents started and completed the Web survey. However, background color did not have a statistical significant influence on the level of breakoff rates on the welcome screen. Only an impact during the Web survey itself was observed but as there is no significant impact on the overall breakoff rate this design feature is not regarded as relevant. Overall, based on these results we can state some more practical implications, which may help to improve the Web survey practice: (1) Keep the Web survey as short as possible. (2) Use elaborate pretests to determine reliable information concerning the time necessary to complete the survey. (3) Providing privacy rights is an important element of the welcome screen, but most respondents prefer a short description of these rights and do not want to spend too much time reading them. An appropriate way of fulfilling these wishes is providing respondents a link to a more detailed description of these rights.

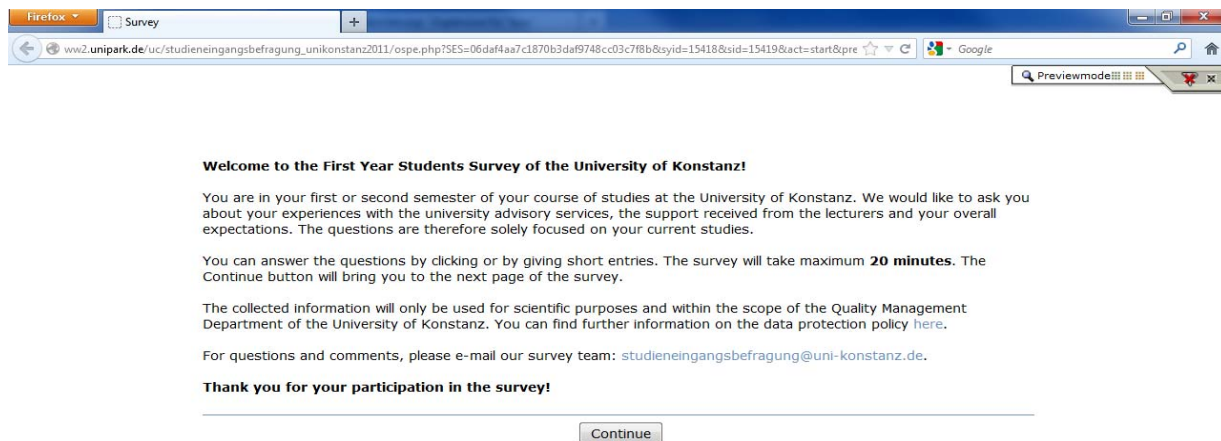
One important limitation of this study is that it was conducted on a sample of a very specific population – first-year university students. It is highly likely that the topic of the Web survey, *i.e.*, the choice of study, is highly salient among students compared to other survey topics and this might increase

the general level of response. Web survey research on populations other than students should then also determine whether the presented results are robust. In addition, it would be interesting to determine the precise effect of the emphasis on privacy rights on response rates: is it determined by the amount of words devoted to this topic, or is the emphasis given on possible problems relating to privacy rights. The specific mechanisms of the observed effect remain unclear and further research is, therefore, necessary.

Acknowledgements

We thank Christine Abele, Valentin Gold, Katharina Holzinger, and Elena Sewelies for their helpful suggestions, comments, and their (data gathering) support, and collaboration.

Appendix A



Appendix B

Dear Mrs Example,

You are now in your first or second semester of your course of studies at the University of Konstanz. In these first few weeks you have gotten to know your department, the university, and the city. We would like to know about your experience with the university advisory services, the support received from the lecturers and your overall expectations. Therefore, we would like to invite you to participate in our First Year Students Survey. Filling in this survey will help us to improve the study conditions of the University of Konstanz.

Please click on the following link to the survey (English version):

<http://personalizedlink>

If you cannot enter the survey via the link, please copy and paste the address in your Web browser.

The participation in this survey is voluntary. The survey is subjected to the data protection regulations and the information you provide will only be used by the Quality Management Department of the University of Konstanz and for scientific purposes. More information on data protection can be found on the welcome screen of the survey.

For questions and comments, please e-mail our survey team: studieneingangsbefragung@uni-konstanz.de.

Thank you for your participation and we wish you all the best with your course of studies!

Kind regards

References

- American Association for Public Opinion Research (AAPOR) (2011). *Standard Definitions: Final Dispositions of Case Codes and Outcome Rates for Surveys*. Retrieved February, 27, 2013, from <http://aapor.org/Content/NavigationMenu/AboutAAPOR/StandardsampEthics/StandardDefinitions/StandardDefinitions2011.pdf>.
- Baker-Prewitt, J. (2003). *All Web Surveys are not Created Equal: Your Design Choices Can Impact Results*. Paper presented at the SumIT03 Global Market Research Symposium, Montreal.
- Bandilla, W., Couper, M.P. and Kaczmirekt, L. (2012). The mode of invitation for web surveys. *Survey Practice*, 5.
- Bosnjak, M., and Tute, T.L. (2001). Classifying response behavior in web surveys. *Journal of Computer Mediated Communication*, 6. Retrieved November, 21, 2012, from <http://jcmc.indiana.edu/vol6/issue3/boznjak.html>.
- Bradburn, N.M. (1978). Respondent Burden. Proceedings of the Section of Survey Research Methods, American Statistical Association.
- Brewer, P.B., Graf, J. and Willnat, L. (2003). Priming or Framing. Media Influence on Attitudes toward Foreign Countries. *Gazette: The International Journal for Communication Studies*, 65, 493-508.
- Cook, C., Heath, F. and Thompson, R.L. (2000). A meta-analysis of response rates in web- or Internet-based surveys. *Educational and Psychological Measurement*, 60, 821-836.
- Couper, M.P. (2000). Web surveys. A review of issues and approaches. *Public Opinion Quarterly*, 64, 464-494.
- Couper, M.P. (2008). *Designing Effective Web Surveys*. Cambridge: Cambridge University Press.

- Couper, M.P., Traugott, M.W. and Lamais, M.J. (2001). Web survey design and administration. *Public Opinion Quarterly*, 65, 230-253.
- Couper, M.P., and Miller, P.V. (2008). Web survey methods. Introduction. *Public Opinion Quarterly*, 72, 831-835.
- Crawford, S.D., Couper, M.P. and Lamias, M.J. (2001). Web surveys. Perceptions of Burden. *Social Science Computer Review*, 19, 146-62.
- Dillman, D.A., Conradt, J. and Bowker, D. (1998). *Influence of Plain vs. Fancy Design on Response Rates for Web Surveys*. Paper presented at annual meeting of the American Statistical Association, Dallas, TX.
- Dillman, D.A., Gertseva, A. and Mahon-Haft, T. (2005). Achieving usability in establishment survey through the application of visual design principles. *Journal of Official Statistics*, 21, 183-214.
- Dillman, D.A. (2007). *Mail and Internet Surveys: The Tailored Design Method*. Hoboken, NJ: John Wiley & Sons, Inc.
- Deutskens, E., De Ruyter, K., Wetzels, M. and Oosterveld, P. (2004). Response rate and response quality of Internet-based surveys: An experimental study. *Marketing Letters*, 15, 21-36.
- Edwards, P.J., Roberts, I., Clarke, M.J., Diguiseppi, C., Wentz, R., Kwan, I., Cooper, R., Felix, L.M. and Pratap, S. (2009). Methods to increase response to postal and electronic questionnaires. *Cochrane Database of Systematic Reviews*, 8, 3. Retrieved November, 21, 2012, from <http://www.ncbi.nlm.nih.gov/pubmed/19588449>.
- Etter, J., Cucherat, M. and Perneger, T.V. (2002). Questionnaire color and response rates to mailed surveys: A randomized trial and a meta-analysis. *Evaluation & The Health Professions*, 25, 185-99.
- Faubert, J. (1994). Seeing depth in colour: More than just what meets the eyes. *Vision Research*, 34, 1165-1186.
- Fay, R.E., Bates, N. and Moore, J. (1991). Lower mail response in the 1990 Census: A preliminary interpretation. In *Proceedings of the Annual Research Conference of the U.S. Census Bureau*, 3-32. Washington DC: Census Bureau. Retrieved November, 27, 2012 from <https://www.census.gov/srd/papers/pdf/rsm2010-13.pdf>.
- Galesic, M. (2006). Dropouts on the web: Effects of interest and Burden experienced during an online survey. *Journal of Official Statistics*, 22, 313-328.
- Galesic, M., and Bosnjak, M. (2009). Effects of questionnaire length on participation and indicators of response quality in a web survey. *Public Opinion Quarterly*, 73, 349-360.
- Ganassali, S. (2008). The influence of the design of web survey questionnaires on the quality of responses. *Survey Research Methods*, 2, 21-32.
- Gorn, G.J., Chattopadhyay, A., Yi, T. and Dahl, D.W. (1997). Effects of color as an executional cue in advertising: They're in the shade. *Management Science*, 43, 1387-1400.

- Groves, R.M., Fowler Jr., F.J., Couper, M.P., Lepkowski, J.M., Singer, E. and Tourangeau, R. (2004). *Survey Methodology*. Hoboken: John Wiley & Sons, Inc.
- Hall, R.H., and Hanna, P. (2004). The impact of web page text-background color combinations on readability, retention, aesthetics, and behavioral intention. *Behaviour & Information Technology*, 23, 183-195.
- Heerwegh, D. (2004). Using Progress Indicators in Web Surveys. Paper prepared for the 59th AAPOR conference (Phoenix, Arizona May 13-16 2004). Retrieved November, 27, 2012, from <https://perswww.kuleuven.be/~u0034437/public/Files/Heerwegh%20Using%20Progress%20Indicators.pdf>.
- Hillygus, S., Nie, N., Prewitt, K., and Pals, G. (2006). Civic Mobilization and Privacy Concerns in the 2000 Census. New York: Russell Sage Foundation.
- Hogg, A., and Miller, J. (2003). Watch out for Dropouts. Retrieved April, 18, 2011, from <http://www.quirks.com>.
- Lozar Manfreda, K., Bosnjak, M., Berzelak, J., Haas, I. and Vehovar, V. (2008). Web surveys versus other survey modes: A meta-analysis comparing response rates. *International Journal of Market Research*, 50, 79-104.
- Mahon-Haft, T.A., and Dillman, D.A. (2010). Does visual appeal matter? Effects of web survey aesthetics on survey quality. *Survey Research Methods*, 4, 43-59.
- Marcus, B, Bosnjak, M., Linder, S., Pilischenko, S. and Schütz, A. (2007). Compensating for low topic interest and long surveys. A field experiment on nonresponse in web surveys. *Social Science Computer Review*, 25, 372-383.
- Peytchev, A. (2009). Survey breakoff. *Public Opinion Quarterly*, 73, 74-97.
- Pope, D., and Baker, R.P. (2005). Experiments in Color for Web-Based Surveys. Paper presented at the FedCASIC Workshops, Washington, D.C.
- Redline, C., and Dillman, D.A. (2002). The influence of alternative visual designs of respondent's performance with branching instructions in self-administered questionnaire. In *Survey Response*, (Eds., R. Groves, D.A. Dillman, E. Eltinge and R. Little), 179-196. New York: John Wiley & Sons, Inc.
- Singer, E., Hippler, H.J. and Schwarz, N. (1992). Confidentiality assurances in surveys: Reassurance or threat? *International Journal of Public Opinion Research*, 4, 256-268.
- Singer, E., Mathiowetz, N. and Couper, M.P. (1993). The role of privacy and confidentiality as factors in response to the 1990 census. *Public Opinion Quarterly*, 57, 465-82.
- Singer, E., Von Thurn, D.R. and Miller, E.R. (1995). Confidentiality assurances and response: A quantitative review of the experimental literature. *Public Opinion Quarterly*, 59, 66-77.
- Singer, E., Van Hoewyk, J. and Neugebauer, R.J. (2003). Attitudes and Behavior - the impact of privacy and confidentiality concerns on participation in the 2000 census. *Public Opinion Quarterly*, 67, 368-384.

- Terhanian, G. (2005). How to Produce Credible, Trustworthy Information through Internet-Based Survey Research. Paper presented at the annual conference of the American Association for Public Opinion Research, Portland, OR.
- Tourangeau, R., Couper, M.P. and Conrad, F. (2007). Color, labels, and interpretive heuristics for response scales. *Public Opinion Quarterly*, 71, 91-112.
- Toepoel, V., Das, M. and Van Soest, A. (2008). Effects of design in web surveys. Comparing trained and fresh respondents. *Public Opinion Quarterly*, 72, 985-1007.
- Vicente, P., and Reis, E. (2010). Using questionnaire design to fight nonresponse bias in web surveys. *Social Science Computer Review*, 28, 251-267.
- Weller, L., and Livingston, R. (1988). Effect of color of questionnaire on emotional responses. *The Journal of General Psychology*, 115, 433-440.
- Yan, T., Conrad, F.G., Tourangeau, R. and Couper, M.P. (2010). Should I stay or should I go: The effects of progress feedback, promised task duration, and length of questionnaire on completing web surveys. *International Journal of Public Opinion Research*, 23, 131-147.