# The Effect of Email Invitation Customization on Survey Completion Rates in an Internet Panel: A Meta-analysis of 10 Public Affairs Surveys

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#### **Abstract**

In online panels, members are accustomed to receiving electronic requests to complete a survey. The purpose of this research is to examine how the subject and body of email invitations to complete online surveys affect the completion rates in samples from a nationally representative probability-based Internet survey panel. Specifically, the intention is to investigate the effect of a customized (study-specific) versus a generic email invitation on survey completion rates, and how the topic of the survey may change this effect. Ten experiments, in which respondents were randomly assigned to a customized or generic email invitation group, were conducted between 2008 and early 2009 using Knowledge-Panel® respondents. Each survey had a different topic, and the results show that generic and custom email invitations elicit similar completion rates. To summarize the experiments, we used meta-analysis statistics, which most aptly fit our research question. The results are discussed in light of current theories of survey participation.

**Key Words:** Internet panel, email invitation, email subject, completion rate.

### 1. Introduction

Online surveys administered to web panels rely almost exclusively on email invitations sent to the sample in order to collect data. Therefore, particular care should be placed on the content of the email invitation. In this paper we study the effect of a generic versus a customized email invitation on response rate. Will revealing the topic of the survey lower or increase the response rate of the study?

We started our literature review with regular postal mail studies. Specifically, we reviewed meta-analysis papers of mail surveys to determine if analogous experiments were conducted in the past. Mail studies can be seen as the closest surrogate for a web survey, because the respondents are contacted with a written message and the survey completion is self-administered. Not surprisingly, we did not find any papers in which a generic invitation was used in comparison to a customized invitation. The reason is simple: in a mail survey the respondents do not usually have an established relationship with the survey organization. For this reason, it would be bizarre not to reveal the topic of the survey. We did, however, find experiments coded in meta-analyses in which survey topics were compared in terms of more vs. less interesting (Edwards, et al., 2002; Edwards, et al., 2007) or saliency (Heberlein & Baumgartner, 1978). In both of these studies, a more interesting or salient topic increased the response rate of the postal questionnaire.

In an early review of email surveys, saliency was not associated with an increase in response rates, although that study found virtually no correlations of any variables

(Sheehan, 2001). In contrast, Cook, Heath and Thompson (2000) did find saliency as a significant predictor of response rates in web surveys in an early meta-analysis of the published literature.

Although we did not find previous experiments comparing generic and customized invitations in email surveys, a similar comparison has been carried out with pre-notification letters for telephone surveys. A French group of sexual behavior analysts conducted two pilots where respondents received either a generic or a more specific pre-notification letter for an upcoming telephone interview. The generic letter described a survey about health, while the specific letter described a survey about sexual behavior and AIDS (*Group d'analyse des comportaments sexuels en France* (ASC-Group), 1992). The response rate (defined as number of interviews divided by number of households with at least one French-speaking eligible person) for the group exposed to the more explicit advanced letter was 36 percentage points lower than that of the standard invitation (79%). See also discussion in De Leeuw and colleagues (2007, p. 420).

### 2. Previous Work on Email Invitations

Spam email is now ubiquitous. It is now estimated that 97% of email sent on the Internet is junk, as reported by a Microsoft security report released in April 2009 (Waters, 2009). Email users must be more cautious than ever when opening messages from an unknown sender or with a suspicious-looking subject line. This is an especially important problem for online survey research. Most Internet survey research has been in survey design, while little has been done on effective strategies in requesting survey participation through email invitation and their effect on response and click-through rates (Klofstad, Boulianne, & Basson, 2008).

Since the primary method of communication for web surveys is through email, the first task in increasing response rates is "how to get the recipient to open the message" (Couper, 2008, p. 305). In searching the literature on previous experiments, we found that the majority of them were conducted with students and not with online panels where the member expects to receive constant communication from the panel organization. While keeping this in mind, methods thought to increase response rates in paper surveys have been shown to have little to no effect on response and click-through rates in web surveys of high school students (Porter & Whitcomb, 2003). These methods include using a personal salutation, a signatory with a high authority, a personal email address, and a high-profile office to sponsor the request.

Altering the subject line of an email invitation has, however, shown modest differences in response and click-through rates. The email subject line has been thought of as an "equivalent of the postage stamp or envelope appearance in a paper survey" (Porter & Whitcomb, 2005, p. 380). This form of communication informs the potential survey respondent as to the purpose and legitimacy of the request. A subject line that included a plea for help as opposed to an offer for participation has been shown to increase response rates (Trouteaud, 2004). Among a "low involvement" sample (not affiliated with the university that was sending the survey request), a modest effect on response rates with different subject lines was found, with the highest response and click-through rates resulting from a blank subject line (Porter & Whitcomb, 2005). These studies suggest that the email subject line affects the respondent's decision whether to participate in an Internet survey, but more research is needed to demonstrate the influence of email subject and body content on response and click-through rates.

Personalization of the invitation in the beginning of the email body (e.g. dear student vs. dear [first name, last name]) has been found to significantly increase response rates (Heerwegh, 2005; Heerwegh, Vanhove, Matthijs, & Loosveldt, 2005; Pearson & Levine, 2003). This is consistent with previous work on mail questionnaires. In fact, a metaanalysis of 56 mail experiments showed that a more personalized approach increased the odds of response by 1.16 (Edwards, et al., 2007). Joinson and colleagues advanced these previous findings on email invitation by showing that personalization works, but works only when the status of the sender is perceived as high (Joinson & Reips, 2007; Joinson, Woodley, & Reips, 2007). Similar results, this time by manipulating the signature of the email body, were reached by Crawford and colleagues (2004). The personalization of email invitations and its influence on nondisclosure of personal information has also been studied. A personal salutation as opposed to a generic salutation has been shown to increase active nondisclosure (selecting a response option "I prefer not to answer"), but not passive nondisclosure (skipping a sensitive question) (Joinson, et al., 2007). The use of a personal login system as opposed to a URL has also been shown to increase nondisclosure to sensitive questions such as income. It is hypothesized that when being identifiable is salient, respondents are more sensitive to disclosing personal information. The highest response rates were found when email invitations were personalized and from a highpower source, but only power was associated with increased response rates (Joinson, et al., 2007).

The email reminder is another important component in attaining high response rates. Including both a deadline to complete the survey and a statement of "selectivity," or making the survey respondent feel part of a select group of people, in the email reminder did increase the response rate (Porter & Whitcomb, 2003). Also, an increased response rate was found when a short survey time (3-5 minutes) was quoted in the email body (Trouteaud, 2004). Sending a survey completion reminder through the regular mail, which is a more costly though more personal form of communication, also did not increase response rates for web-based surveys. A research study that combined paper and email pre-notifications and reminders to test the impact of mixed-mode contacts found little differences in response rates across the different experimental groups (Porter & Whitcomb, 2007).

It is important to continue research in how the method of contacting respondents and the content of those contacts influence participation in web surveys. An unpublished study conducted by Damschroder at the University of Michigan found that when "recipients have a relationship with the sender" (as is the case with many panel vendors) this "trumps the subject line in determining whether the e-mail is opened, read, and acted upon" (Couper, 2008, p. 314). While Couper predicts that "manipulations of e-mail content may have little effect because potential respondents aren't paying much attention to the messages, if they read them at all" (Couper, 2008, p. 324), it needs to be determined when manipulations in email content can have an effect on response and click-through rates, and most importantly, on data quality and sample representativeness. For example, in a study conducted among a Norwegian customer database of loyalty cards (where customers registered their email address to receive information), half of the sample received a generic email invitation asking them to complete a survey, while the other half received the following subject line: "Win a weekend for two to Nice". The generic email invitation group had a response rate of 66% compared to 52% of the other group (Kent & Brandal, 2003). In this case, even if there is an established relationship with the company, the specific subject might have been taken as more suspicious or as spam, therefore eliciting a

lower response rate. It is also important to notice that the subject line did not mention a survey request.

### 2.1 Summary on Email Invitations

From the literature of postal mail surveys we learned that interest and saliency are key variables in predicting response rates. At the same time, we do not know the effect of a generic survey invitation where the topic is not mentioned because apparently these experiments were not conducted in the mail literature. In an online panel, however, email is the preferred (and sometimes only) method of contact with potential respondents to invite them to complete a survey. For this reason, particular attention should be paid in writing the subject and body of the email message. Experiments manipulating these two pieces of information show that response rates can be improved through personalization, if possible, sending the email from a perceived high-power source, or pleading for help. These results do not always translate to online panels where respondents have an established relationship with the organization. Couper (2008, p. 315) advises not to specifically mention the topic of the survey in the subject line because it can potentially produce response bias. In our study we focus only on completion rates and not on response bias.

### 3. On Meta-analysis

Meta-analysis is the statistical combination of results produced by different studies. Meta-analysis focuses on pair-wise comparisons between one group, generally called the *control group*, and one or more *treatment* groups (Deeks, Higgins, & Altman, 2008). Meta-analysis is therefore an effective tool to analyze our email invitation experiment and identify a general trend in the outcome, if any. Although meta-analysis is more common in the medical literature, more recently it has been applied to survey research (e.g. Lensvelt-Mulders, Hox, van der Heijden, & Maas, 2005). In the area of response rates comparisons we find many research papers. For example, differences in response rates by survey mode are studied by Lozar Manfreda and colleagues (2008) and by Shih & Fan (2007, 2008, 2009), the effect of incentives on response rates in online panels by Göritz (2006), the effect of advance letters on response rates in telephone surveys by de Leeuw et al. (2007), and methods to increase response rates to mail surveys by Edwards and colleagues (2007).

### 4. Data and Methods

### 4.1 Methodology and Description of the Studies

### 4.1.1 KnowledgePanel® methodology

Knowledge Networks has recruited the first online research panel that is representative of the entire U.S. population. Unlike opt-in sources, Knowledge Networks panel members are randomly recruited by probability-based sampling, and households are provided with access to the Internet and hardware if needed (non-Internet households). The households who already have Internet access from home at the time of recruitment are offered a small token for participating in each survey, while the non-Internet households do not receive an incentive for each completed survey because instead they benefit from free Internet access.

Knowledge Networks selects households using random-digit dial (RDD) and more recently with address-based sampling methods (ABS) (DiSogra & Callegaro, 2009). Once a person is recruited to the panel, they are contacted by email. For a more detailed sum-

mary of Knowledge Networks' panel recruitment methodology, please refer to Dennis (2009).

### 4.1.2 Survey administration

Samples are drawn at random from among active panel members. Depending on the study, eligibility criteria will be applied, or in-field screening of the sample will be carried out. Sample sizes range widely depending on the objectives and design of the study.

Once assigned to a survey, members receive an email invitation letting them know there is a new survey available for them. This invitation contains a link that can be used to access the online survey instrument. No login name or password is required. See Appendix A and B for the complete text of the email invitations for the ten studies examined as part of this project.

For this study, each respondent in each survey was randomly assigned to one of two treatment conditions which received different email invitations as outlined in Table 1.

Study	Generic Email subject	Customized Email Subject		
1	Your Latest KnowledgePanel Survey ( <survey number="">).</survey>	Immigration in the U.S.		
2		Tax Time		
3		Terrorism and Homeland Security National Security U.S. Foreign Policy Preparing for Disasters Views on Iraq		
4				
5				
6				
7				
8		Relations of U.S. with Other Countries Survey		
9		Donating Blood		
10		Survey About Electing Government Officials		

Table 1: Email Subject Line for Each Study

The survey field period depended on the client's needs and ranged from seven to twenty-one days. After approximately four days, automatic email reminders were sent to all non-responding panel members in the sample. For this experiment, all participants in each condition received the same automatic email reminder (Appendix C).

In addition to accessing surveys from the link in the notification email, each individual has a personalized "home page" listing all the surveys that were assigned to them and have yet to be completed. For all surveys, the link on the "home page" displayed the same text as the Custom Email Subject in Table 1. Respondents can click on the link to access the survey directly, without going into their email. Panelists can access all surveys using either of these methods.

### 4.2 Methods

### 4.2.1 Computing effect sizes

In order to isolate the pure effect of the email invitation on completion rate, some cases were excluded from the analysis:

• Bounce back emails. When the email invitation was returned to the sender, there is a high chance that the respondent did not read it, therefore the case should not be counted in measure of the effectiveness of the email invitation message.

Respondents who accessed and completed the survey through the member page.
 Panel members can complete a survey either by clicking on a link in the email invitation or by logging into their own panel member page. If they log into their own member page, they did not read the email invitation. For this reason, such cases should be excluded from the analysis.

Based on the following exclusion we then define the modified completion rate as:

The difference in the modified completion rate between a group assigned to a custom email invitation and a group assigned to a generic email invitation is the effect size measure studied in this meta-analysis. The effect size indicates the magnitude of the treatment effect, in our case the custom email invitation. The appropriate effect size for comparing proportions between an experimental group (custom invitation) and a control group (generic invitation) is the logged odds ratio (Borenstein, Hedges, Higgins, & Rothstein, 2009; De Leeuw, et al., 2007; Fleiss & Berlin, 2009). The logged odds ratio has the advantage to be symmetric around 0 and it is also suggested for the graphical representation (forest plots) of the effect sizes.

The logged odds ratio is defined (Borenstein, Hedges, Higgins, & Rothstein, 2008) as

$$LOR = \ln \left( \frac{n_{Cust} (N_{Gen} - n_{Gen})}{n_{Gen} (N_{Cust} - n_{Cust})} \right)$$
 (2)

this variable is normally distributed with a known sampling variance given by:

$$LOR_{\text{var}iance} = \frac{1}{n_{Cust}} + \frac{1}{N_{Cust} - n_{Cust}} + \frac{1}{n_{Gen}} + \frac{1}{N_{Gen} - n_{Gen}}$$
(3)

where *Gen* stands for generic email invitation and *Cust* stands for Custom email invitation. A positive *LOR* signifies that the effect is in favor of the Custom email invitation, while a negative *LOR* signifies that the effect is in favor of the Generic email invitation.

#### 4.2.2 Coding and analysis

Some survey characteristics were also coded in each study as shown in Table 2.

**Table 2:** Study Characteristics

Study characteristic	Notes		
Number of hours between initial invitation and reminder			
Number of hours the survey was in the field			
Length of the survey	Median length in minutes		
Day the survey invitation was sent	1 Monday		
	2 Tuesday		
	3 Wednesday		
	4 Thursday		
	5 Friday		

The analysis will be performed by separating each study subject into two groups: incentive and non-incentive. The main reason is that incentive respondents receive a small token of appreciation for each survey that they complete, which is equivalent to 1,000 bonus points that they can redeem for cash (1,000 bonus points = \$1). These members already have a computer and an Internet connection from home at the time of recruitment (Internet households). Non-incentive participants, however, do not get any incentive because they receive free equipment and Knowledge Networks pays for the cost of the Internet connection (non-Internet households). Analyzing the data by these two groups will allow us to identify whether the custom email invitation had an effect on a specific group. It is also important to remember that incentive and non-incentive households are demographically different, with non-incentive or non-Internet households (Zhang, Callegaro, & Thomas, 2008). Data analysis was performed with *Comprehensive Meta-Analysis* ver. 2.2.048 (Borenstein, et al., 2008).

### 5. Results

## **5.1 Preliminary Descriptive Analysis**

Table 3 presents the descriptive statistics for the studies in question.

**Table 3:** Descriptive Statistics for the Modified Completion Rate among Conditions

	Mean	SD	Min	Max
Number of hours survey was in the field	208.5	61.4	142	321
Hours between invitation and email reminder	100.5	15.9	78	121
Incentive group	Mean	SD	Min	Max
Sample size	729.2	355.7	321	1398
Median time	4.2	2.3	1	10
Modified completion rate custom invitation	52.1 <sup>a</sup>	5.6 <sup>a</sup>	37.3	57.2
Modified completion rate generic invitation	$53.0^{a}$	$7.5^{\mathrm{a}}$	32.5	60.1
Modified completion rate difference	-0.9			
Non incentive group	Mean	SD	Min	Max
Sample size	357.0	187.3	80	573
Median time	6.4	3.1	3	14
Modified completion custom invitation	$61.6^{a}$	4.4 <sup>a</sup>	44.7	64.3
Modified completion rate generic invitation	59.4 <sup>a</sup>	$5.0^{\rm a}$	40.5	66.7
Modified completion rate difference	2.2			

<sup>&</sup>lt;sup>a</sup> Weighted average and weighted SD

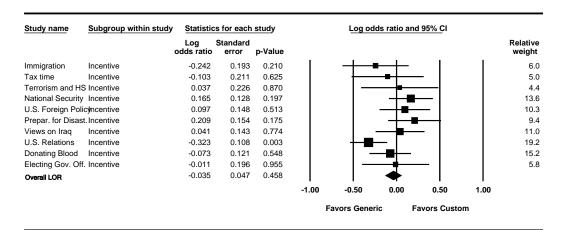
On average, the surveys were in field for approximately eight and a half days, with an email reminder sent after four days. The studies used in the analysis were also relatively short surveys. This is also indicated by a low number of break offs, with a weighted average of 5.1% across studies. It is also important to note that the modified completion rate is not equal to the more commonly reported completion rate (Callegaro & DiSogra, 2008), but is in fact lower. The reason is that in our calculation we excluded respondents who completed the survey by accessing it from the panel member's page. From the descriptive statistics, it appears that the difference between a custom invitation and a generic invitation is minor for the incentive panelists, and that the custom email invitation is

eliciting a slightly higher completion rate for the non-incentive panelists. The results from the meta-analysis will put these summary statistics into prospective and test if the difference among the two groups reaches statistical significance.

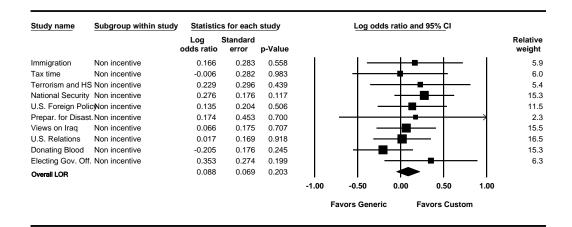
#### 5.1.2. Weighted effect sizes results

We decided to run the analysis suing fixed-effect models for each subgroup. The reason is because all studies were run using very similar samples, in the same panel a relatively short time period. The test of homogeneity, Q, supported the initial decision indicating that the effect size distribution is homogeneous (Q=14.598, p=0.103 for incentive and Q=5.528, p=0.786 for non-incentive).  $I^2$  represents the proportion of observed variance that reflects real differences in effect size and has a range of 1 to 100 (Borenstein, et al., 2009).  $I^2$  was of 0% for the non-incentive group and of 38.47%, which is considered between low and moderate (Higgins, Thompson, Deeks, & Altman, 2003) for the incentive group. This statistics suggest that there is more variability in the incentive group in comparison to the non incentive group.

When using the fixed-effect model the effect size of a custom email invitation on the modified completion rate is LOR = -0.035 for incentive panel members with a p value of 0.458, and LOR = 0.088 for non-incentive members with a p value of 0.203. This means that there are no statistically significant differences in modified completion rates between a generic email invitation and a custom email invitation. In fixed effect models the weight of each study is given by 1/within study variance while in a random effect model the weight is given by 1/(within study variance + between study variance) (Borenstein, et al., 2009). In Figure 1a and 1b we report individual and overall effect sizes of the impact of a generic email invitation versus a custom email invitation for incentive and non-incentive panelists.



**Figure 1a:** Individual and overall effect sizes for the *incentive* sample of the impact of a custom email invitation versus a generic email invitation under a fixed model effect size.

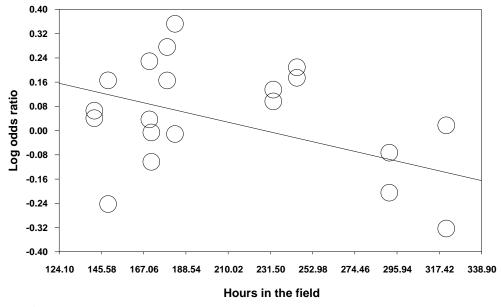


**Figure 1b:** Individual and overall effect sizes for the *non-incentive* sample of the impact of a custom email invitation versus a generic email invitation under a fixed model effect size.

### 5.1.3 Moderator analyses for incentive panelist: meta-regression

In Table 3 we presented the study characteristic coded for each experiment. Because of the small number of studies (20 in total) we cannot use many predictors in a meta-analysis. For this reason we decided to run the meta-analysis using all studies (incentive and non incentive) and focus only on the variable number of hours the study was in the field. We also know that length of the survey in the field is strongly correlated with completion rate. Figure 2 shows the scatterplot of the regression of log odds ratio of completion rate on length of the field period.

### Regression of Hours in the field on Log odds ratio



**Figure 2:** Regression of number of hours in the fields on log odds ratios of the modified completion rate

The negative value of the slope (-0.00150, p=0.011) indicates that an increase in the length of time that the survey was in the field increases the generic email invitation's effectives as shown in Figure 2. The weighted sum of square Q is 6.335, p=0.011. Shorter field periods favor custom email invitation modified completion rates, while longer field periods favor generic email invitation modified completion rates.

#### 6. Discussion

In our study we randomized ten different samples to receive either a generic or a custom email invitation. Survey topics varied among the general category of "public affairs." Our meta-analysis revealed no effect on completion rates using a custom email invitation versus a generic email invitation for a probability-based online panel. Although there is evidence that personalizing a message can increase response rates, a topic-specific message as in our case did not seem to make a difference. We also have to remember that both versions of our survey invitations already contained the elements of personalization that have been proven to increase completion rates (e.g. authority and calling the respondent by name).

Because of the previously-established relationship between the respondents and Know-ledge Networks, it is possible that the strength of this relationship overcame variations in subject line and body. It might be also the case that we have a ceiling effect: the email invitation already contains all the elements proven successful to increase response rates, therefore room for improvement is small. At the same time, the fact that a generic email invitation elicits the same response rate as that of a generic one is reassuring, thus avoiding potential bias in revealing the topic of the survey.

When looking back at the topic of our experiments and the period the data were collected the reader will notice that they were all both interesting and salient. One possible interpretation can be that when the topic is interesting and salient, a custom email invitation can be equally effective as a generic email invitation. The next research question would be to compare a generic versus a custom email invitation for less interesting and salient topics. We also have to remember that KnowledgePanel members are accustomed to receiving generic email invitations more often than specific ones. For this reason we expected a higher completion rate for the custom invitation, at least as the result of novelty effect.

The relationship between the length of field period and email invitation type is intriguing. We might pose that a specific subject attracts the respondents who are more interested in the subject at first (early respondents), while a generic subject infers to the respondents that they can answer at any time. Leaving the field period open longer allows for a chance to increase the response rate at a higher level than in the case of the custom email invitation. We also have to remember that the reminders were generic for both groups. Although the majority of responses were collected before the reminder was sent out, this can be a potential confounding in the study and might help to explain the meta-regression results.

Lastly, we do not know how our results can generalize to cross-sectional surveys where there is no established relationship between the survey organization and the respondent. In that case we might find different results.

When using an online panel to conduct their research, survey practitioners should think about what kind of email invitation they should be using, and if it can have an effect on response bias and response rates. In many cases the topic of the survey has to be revealed because of Institutional Review Board regulations. In that case, careful wording and decisions about how much to reveal about the topic need to be considered to avoid a negative impact on response rates.

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### Appendix A

#### Generic email invitation text

Subject: Your Latest KnowledgePanel Survey 12345.

Dear First name,

Thanks for being an integral part of KnowledgePanel! Your latest survey can be accessed by clicking the following link:

Click Here to Start Survey

Note: the number in the subject line was different for each survey; we use 12345 as an example

### Appendix B

#### Custom email invitation text survey 1

Subject: Immigration in the U.S. 12345.

Dear First name,

We have some questions for you about immigration in the United States. We want to hear every-one's opinions about this topic, and appreciate your prompt response to this survey!

This survey can be accessed by clicking the following link:

Click Here to Start Survey

### Custom email invitation text survey 2

Subject: Tax Time 12345.

Dear First name,

As the April tax deadline rapidly approaches, we have some questions for you about your views on different tax credits and policies. We appreciate hearing what you have to say about this topic!

### Custom email invitation text survey 3

Subject: Terrorism and Homeland Security 12345.

Dear First name,

We have some questions for you about terrorism and homeland security. We'd like to hear everyone's opinions on this topic to get the most accurate views possible. Thank you for letting us know what you think!

#### Custom email invitation text survey 4

Subject: National Security 12345.

Dear First name,

We have some questions for you about America's national security policies and practices. Whether you're a hawk or a dove, we'd like to hear your thoughts on this topic.

### Custom email invitation text survey 5

Subject: U.S. Foreign Policy 12345.

Dear First name,

We have some questions for you about how the United States works with other countries. Regardless of your political views, we look forward to hearing what you have to say!

#### Custom email invitation text survey 6

Subject: Preparing for Disasters 12345.

Dear First name,

We have some questions for you about making sure you and your loved ones are ready for when unexpected disasters occur. We'd like to hear your opinions on this topic at your earliest convenience.

#### Custom email invitation text survey 7

Subject: Views on Iraq 12345

Dear First name,

We'd like to understand what your thoughts are on the U.S. presence in Iraq. Whether you think the U.S. should maintain its presence in Iraq or withdraw as soon as possible, we want to hear what YOU think!

### Custom email invitation text survey 8

Subject: Relations of U.S. with Other Countries Survey 12345

Dear First name,

We would like to get your opinions about the relations of U.S. and its leaders with other countries around the world.

### Custom email invitation text survey 9

Subject: Donating Blood 12345

Dear First name,

We have some questions for you about blood donation. Whether you donate regularly or not at all, we'd like to hear your opinions on this topic!

### Custom email invitation text survey 10

Subject: Survey About Electing Government Officials 12345

Dear First name,

We'd like to hear your opinions about how you go about electing government officials. We hope you'll let us know what you think about this topic at your earliest convenience!

# Appendix C

#### Generic email reminder text

Dear First name,

We recently sent you a survey. We'd appreciate you taking the survey at your earliest convenience by using the web address, below. Depending on your email reader, you may need to copy and paste the link into your web browser. If you have already completed the survey, thank you and please discard this email.