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Effects of SMS Reminders on Online Questionnaire Participation

Cornelia Andersson
cornelia.andersson@som.gu.se
The SOM Institute, University of Gothenburg

Julia Bergquist
julia.bergquist@som.gu.se
The SOM Institute, University of Gothenburg

ABSTRACT

Based on four randomized experiments in four different studies, conducted in Sweden and Western Sweden in 2022 and 2023, this Note on Survey Methodology examines how four different SMS formats—direct questionnaire links, questionnaire links with login credentials, without any link, or no SMS at all—affect response rates and data quality in online questionnaires. Findings showed that SMS reminders generally improved response rates compared to not sending any SMS, though with varied effects. The results demonstrated that SMS reminders were effective in raising online survey participation, but the content and design of the SMS mattered. In Study 1 and 2, including direct questionnaire links significantly increased response rates compared to links with login credentials but led to a higher share of sample persons not completing the online questionnaire. In Study 3 and 4, including both link and login credentials in the SMS instead increased response rates compared to not sending any text at all. The findings

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emphasize the need for balancing accessibility with respondent engagement in order to sustain higher response rates without it coming at the cost of data quality.

INTRODUCTION

Surveys are increasingly being challenged by declining response rates, which heightens the risk of nonresponse bias. Respondents' decisions to complete a questionnaire are influenced by the perceived effort in relation to the anticipated benefits of participation (Groves, Singer, & Corning, 2000). Consequently, minimizing the effort required for respondents to access and complete a questionnaire is essential for reducing costs in survey research. The rapid increase in the use of smartphones has opened up to a new method of collecting data. Although the use of smartphones in Sweden is not equally distributed among different age groups (Internetstiftelsen, 2024), respondents in general are increasingly more inclined to complete web surveys on their smartphones rather than on their PCs (Antoun, Couper & Conrad, 2017; Mavletova & Couper, 2014).

Due to this recent development, one possible way of lowering the threshold for sample persons to access an online questionnaire is to send out reminders via SMS, containing links to the web survey. Contemporary survey research suggests that sending out invitations via SMS encourages sampled persons to complete the questionnaire on their smartphones (McGeeny & Yan, 2016; Andreadis, 2020), although this may increase the risk of higher break-off rates (McGeeny & Yan, 2016). Other studies found no significant difference in data quality between completing the questionnaire on a smartphone as opposed to a PC (Antoun, Couper & Conrad, 2017; Lee et al., 2019). As encouraged by (Link et al, 2014), given recent research, the increasingly widespread use of smartphones, and to the exponentially increasing cost of postage in Sweden, the potential effects of different forms of SMS-invitations to online questionnaires may be crucial to assess.

This note presents the results of four randomized experiments conducted in 2022 and 2023. The main aim of the experiments was to assess the impact of sending reminders via SMS including different content, such as directing the sampled persons to an online questionnaire, providing login credentials, or sending no SMS at all.

HYPOTHESIS

RESPONSE RATES

H1a: Sample persons who receive a direct link in the SMS-reminders that give them direct access to the online questionnaire without login credentials may be less likely to respond to the online questionnaire, than sample persons who receive a general SMS link to the online questionnaire combined with login credentials.

H1b: Sample persons who receive a general SMS link to the online questionnaire combined with login credentials may be less likely to respond to the online questionnaire, than sample persons who receive an SMS referring to the paper questionnaire.

H1c: Sample persons who receive an SMS referring to the questionnaire may be less likely to respond to the online questionnaire, than sample persons who do not receive any SMS.

DATA QUALITY

H2a: Sample persons who receive a direct link in the SMS-reminders that give them direct access to the online questionnaire without login credentials may be more likely to break-off or give a partial response than sample persons who receive a general SMS link to the online questionnaire combined with login credentials.

H2b: Sample persons who receive a general SMS link to the online questionnaire combined with login credentials may be more likely to break-off or give a partial response than sample persons who receive an SMS referring to the questionnaire.

H2c: Sample persons who receive an SMS referring to the questionnaire may be more likely to break-off or give a partial response than sample persons who do not receive any SMS.

OVERVIEW OF THE STUDIES

In all studies, only respondents with registered mobile phone numbers were included. The first and second study, which henceforth will be referred to as “Study 1” and “Study 2”,

were conducted in the National SOM-survey 2022 and The West Sweden Regional survey 2022 and consisted of two experimental groups each. The first experimental group received SMS-reminders including an URL-address to the login page and a passcode to log in to the online questionnaire. The second experimental group received SMS-reminders including an URL-address to the online questionnaire that redirected to the online questionnaire directly, without requiring a passcode.[1] The experimental design of the third and fourth study, henceforth referred to as "Study 3" and "Study 4", conducted in the National SOM-survey 2023 and The West Sweden Regional survey 2023, was slightly altered. The samples of Study 3 and 4 were randomized into three experimental groups, where the first group did not receive any SMS-reminder, the second group received SMS-reminders referring to the questionnaire and the third group received SMS-reminders including an URL-address to the login page and a passcode to log in to the online questionnaire.

[1] Study 1 and 2 did not include a control group where sampled persons did not receive any kind of SMS, which restricted the analysis to some extent.

Table 1. *Overview of Experimental Groups*

	The National SOM-survey 2022 (Study 1)		The West Sweden Regional SOM-survey 2022 (Study 2)		The National SOM-survey 2023 (Study 3)			The West Sweden Regional SOM-survey 2023 (Study 4)		
	Group 1	**Group 2**	**Group 3**	**Group 4**	**Group 5**	**Group 6**	**Group 7**	**Group 8**	**Group 9**	**Group 10**
SMS sent…	Yes	Yes	Yes	Yes	**No**	Yes	Yes	**No**	Yes	Yes
…without any link but referring to postal questionnaire	-	-	-	-	-	Yes	-	-	Yes	-
…with direct link to the online questionnaire	Yes	-	Yes	-	-	-	-	-	-	-
…with general link to the online questionnaire and login credentials	-	Yes	-	Yes	-	-	Yes	-	-	Yes
	n = 3,648	*n* = 3,318	*n* = 738	*n* = 710	*n* = 8,749	*n* = 8,872	*n* = 8,629	*n* = 2,048	*n* = 1,978	*n* = 1,974

METHODS AND MATERIALS, STUDY 1 & STUDY 2

PREREGISTRATIONS, STUDY 1 & STUDY 2

The hypotheses, procedure, exclusion criteria, and analysis plan of Study 1 and 2 were preregistered before data collection had completed and prior to analyses. The preregistration can be found at https://osf.io/tha7j/

SAMPLES, STUDY 1 & STUDY 2

Sample 1 and Sample 2 were both random samples of individuals registered by the Swedish Tax Authority as residing in Sweden on the 9th of August 2022. Only individuals who were 16-90 years old were invited to complete the questionnaire. The number of participants invited in the National SOM-survey was 26,250, which consists of seven different editions randomized among participants, and the total number of survey questions varies between 57 and 65. The West Sweden Regional had 6,000 invited participants, which consisted of one edition and the total number of survey questions was 72. Sample 1 and Sample 2 were checked to not contain the same respondent. If that occurred, other randomly selected individuals replaced those individuals.

EXPERIMENTAL DESIGN AND PROCEDURE, STUDY 1 & STUDY 2

Study 1 and Study 2 used identical experimental designs and procedures. In parallel with the SMS content experiments described in this report, additional experiments on push-to-web and QR codes were conducted. These experiments were controlled to ensure they did not interfere with one another's results.

The samples were sent a pre-notification by postcard one week prior to the first invitation. In the first invitation they received access to complete the questionnaire on paper or via web. SMS-reminders were sent 28, 45, 67 and 78 days after the first invitation. Sample persons who had not yet responded 27 days after the first invitation was sent out (the day before the first SMS reminder was sent out) were randomly assigned to one of two groups in the SMS-experiment using random numbers extracted from random.org.

Sample persons that had not submitted their questionnaire and had not refused to participate received four mailed reminders with an offer to complete the questionnaire either through a paper-and-pencil questionnaire or by the online questionnaire, one postcard reminder, and four SMS messages including a link to the online questionnaire sent to their cell phone (either with a direct link or a general depending on treatment group) (i.e., nine reminders in total).

ANALYSIS PLAN, STUDY 1 & STUDY 2

RESPONSE RATE

To compare response rates, Response Rate 1 (RR1) was estimated according to the guidelines of the American Association for Public Opinion Research (AAPOR, 2023). Only sample persons who answered 80% or more of the eligible questions were considered a response. The parameters of an OLS regression equation projected the difference in RR1 between the different experimental groups. As exploratory analyses not mentioned in the preregistration, the parameters of OLS regressions were estimated predicting response rate and SMS using age, sex, and born/not born in Sweden as interactions respectively. In order to isolate the effect of the different treatments, respondents who participated and sent in the survey before each study's first SMS reminders were sent out were excluded from the analyses. Because of the different rates of phone numbers identified for the sample persons in the different studies, the analysis only included sample persons whose phone numbers could be identified.

DATA QUALITY

To compare data quality amongst the different groups, the share of breakoffs and partials were compared. Sample persons were defined as completes if they entered the questionnaire and answered 80% or more of the questions, breakoffs if they answered between 50% and 79.9%, and partials if they answered less than 50% of the questions. In order to isolate the effect of the different treatments, respondents who participated and sent in the survey before each study's first SMS reminder were excluded from the analyses.

RESULTS, STUDY 1 & STUDY 2

RESPONSE RATES

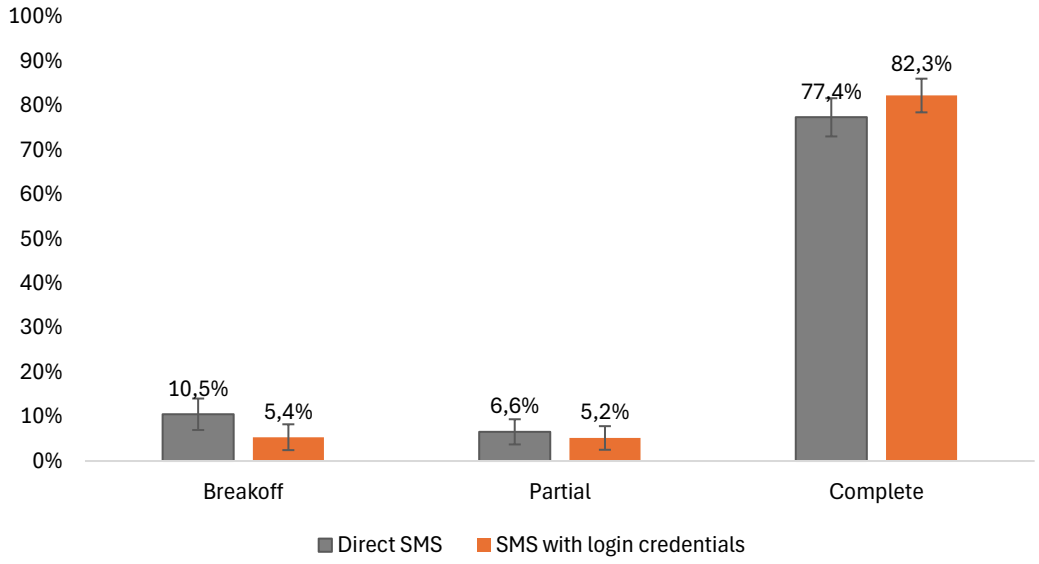
In Study 1, 10.3 percent of those who received a direct link in the SMS-reminders that gave them direct access to the online questionnaire without login credentials completed the online questionnaire, which was statistically significantly higher than the 8.8 percent who received a general SMS link to the online questionnaire combined with login credentials (*b*

= -1.55, *SE* = .70, *p* = .033). Similarly, in Study 2, 10.8 percent of those who received a direct link in the SMS-reminders that gave them direct access to the online questionnaire without login credentials completed the online questionnaire, which was statistically significantly higher than the 7.6 percent who received a general SMS link to the online questionnaire combined with login credentials (*b* = -3.23, *SE* = 1.15, *p* = .034). No interaction effect could be found for sex, age, or born/not born in Sweden.

DATA QUALITY

In Study 1, 17.1 percent of those who received an SMS reminder containing a direct link that gave them access to the online questionnaire without login credentials were defined as breakoff/partials, which was statistically significantly higher compared to the 10.5 percent who received a general SMS link to the online questionnaire combined with login credentials (*b* = -6.73, *SE* = 1.49, *p* = <.001). See Figure 1 for detailed overview.

Figure 1. ***Detailed overview of breakoff/partials for Study 1.***



However, in Study 2, 17.6 percent of those who received a direct link in their SMS reminders were defined as breakoff/partials, which was not significantly different from the 15.7 percent who received a general SMS link to the online questionnaire combined with login credentials (*b* = -2.58, *SE* = 3.43, *p* = .450).

METHODS AND MATERIALS, STUDY 3 & STUDY 4

REASON FOR REPLICATION AND FURTHER ANALYSES

As seen in the analysis section of Study 1 and Study 2, sending SMS with direct links to the online questionnaire increased response rates compared to sending SMS with links to the online questionnaire combined with login credentials. Suggestively, not requesting the sample persons to enter login credentials lowered the threshold to enter the questionnaire, which in turn increased the probability of the sample persons to instead become respondents. However, this increase in response rate appeared to be at the expense of data quality. There was a significantly higher rate of breakoff/partials in Study 1, and although the difference between the experimental groups of Study 2 was insignificant ($p = .450$), the pattern of a higher degree of breakoff/partials amongst those without login credentials provided in the SMS reminder remained the same.

As a result of this, there was a need to further investigate the potential of additional types of SMS messages. As mentioned previously (see Table 1), in Study 3 and Study 4 the sample persons received the same SMS reminder as in Study 1 and 2, containing a link to the online questionnaire and login credentials. In addition, one experimental group received an SMS that did not contain a link but a reminder of their initial postal invitation, and one group did not receive any SMS. Although SMS messages containing direct links without login credentials increased response rates, these were not sent out in Study 3 and 4 because of their negative effect on data quality in terms of breakoff/partials.

PREREGISTRATIONS, STUDY 3 & STUDY 4

No preregistration was done for Study 3 and Study 4.

SAMPLES, STUDY 3 & STUDY 4

Sample 3 and Sample 4 were both random samples of individuals registered by the Swedish Tax Authority as residing in Sweden 16-90 years old on the 14th of August 2023. The National SOM-survey invited 26,250 individuals to complete the complete the

questionnaire, which consisted of seven different editions randomized among participants, with a total number of survey questions that varied between 58 and 68. The West Sweden Regional survey invited 6,000 individuals to complete the questionnaire, which consisted of one edition and with a 73 survey questions in total. Sample 3 and sample 4 were checked to not contain the same respondent. If that occurred, other randomly selected individuals replaced those individuals.

EXPERIMENTAL DESIGN AND PROCEDURE, STUDY 3 & STUDY 4

Study 3 and Study 4 used identical experimental designs and procedures. In parallel with the SMS content experiments described in this report, additional experiments on QR codes and unconditional symbolic incentives were conducted. These experiments were controlled to ensure they did not interfere with one another's results.

Study 3 and 4 were replications of Study 1 and 2 regarding procedures and reminders sent, with a few alterations. Sample persons were randomized into three different experimental groups using numbers extracted from random.org before data collection started. SMS-reminders were sent 31, 50, 66, and 80 days after the first invitation.

ANALYSIS PLAN, STUDY 3 & STUDY 4

Analysis plan for Study 3 and Study 4 was identical to the analysis plan of Study 1 and Study 2.

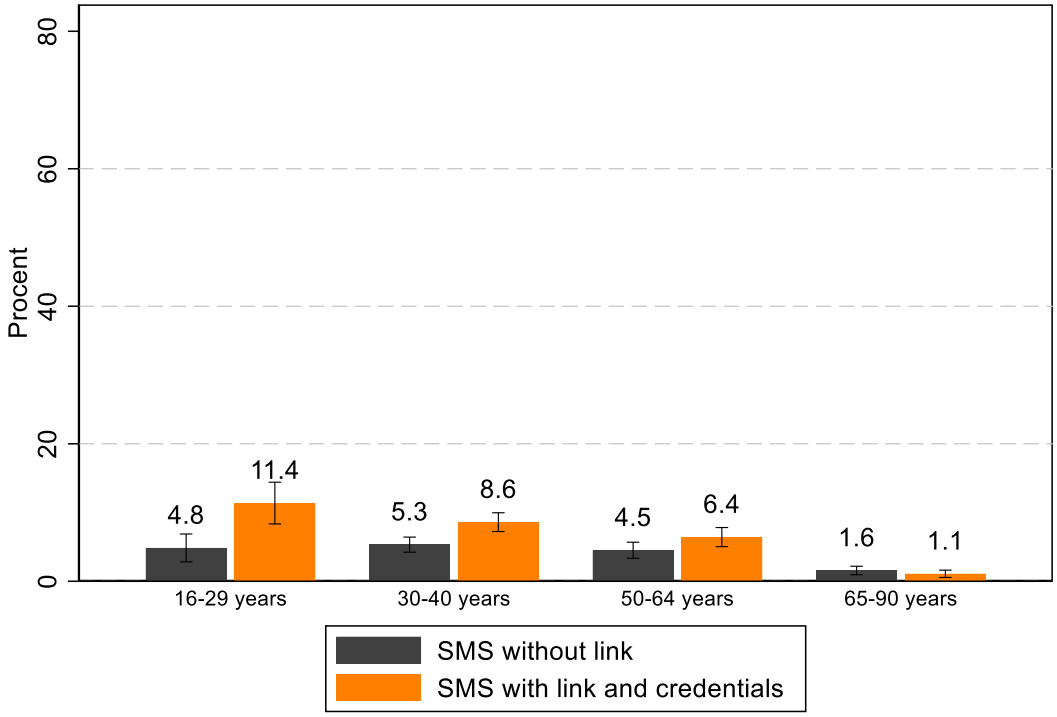
RESULTS, STUDY 3 & STUDY 4

RESPONSE RATES

In Study 3, 5.9 percent of those who received a general SMS link to the online questionnaire combined with login credentials completed the online questionnaire, which was significantly higher than the 3.9 percent of those who received an SMS without any link (b = 2,07, SE = .44, p = <.001). However, in Study 4, 4.9 percent of those who received a general SMS link to the online questionnaire combined with login credentials completed the online questionnaire, which was not significantly different from the 3.8 percent of those

who received an SMS without any link (b = 1.09, SE = .89, p = .219). For Study 3 or 4, no interaction effect could be found for sex or born/not born in Sweden. However, age had a significant interaction effect on the correlation between type of link in the SMS and response rate in Study 3. For the youngest age group (16 to 29 years old), 4.8 percent of those who received an SMS without any link completed the online survey, compared to 11.4 percent of those who were sent an SMS combined with login credentials (see Figure 2).

Figure 2. ***Different SMS links effects on response rates (RR1) across different age groups in Study 3.***

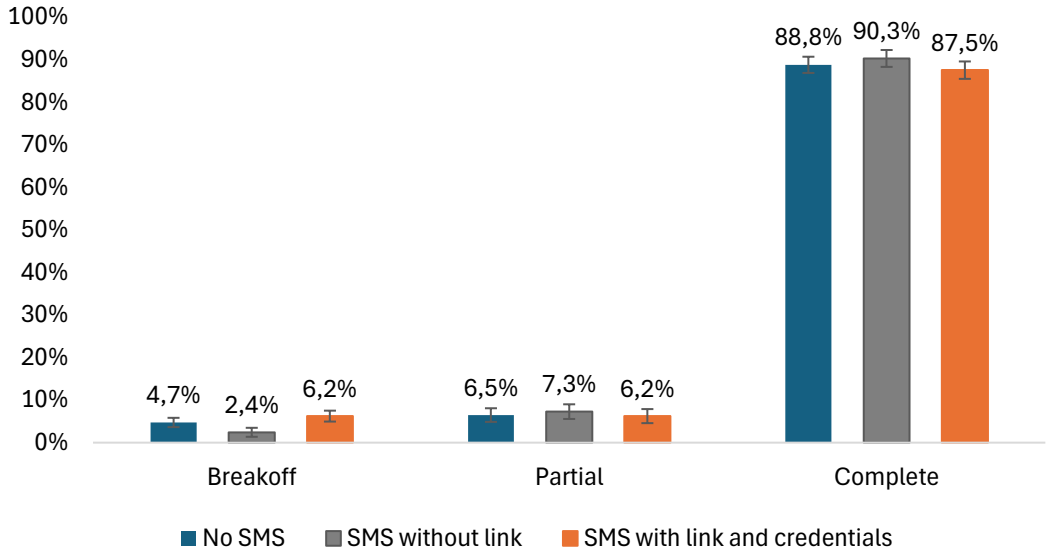


In Study 3, 3.5 percent of those who received an SMS without any link participated via the online questionnaire, which was significantly higher than the 2.9 percent of those who did not receive any SMS (b = .83, SE = .38, p = .025). However, in Study 4, 2.98 percent of those who received an SMS without any link participated via the online questionnaire, which was not significantly different to the 2.88 percent of those who did not receive any SMS (b = .93, SE = .77, p = .225). No interaction could be found for sex, age, or born/not born in Sweden.

DATA QUALITY

In Study 3, 12.4 percent of those who received a general SMS link to the online questionnaire with login credentials were defined as breakoff/partials, which was marginally higher than the 9.7 percent of those who received an SMS without any link (b = 2.75, SE = 1.63, p = .091). In the same study, those who received an SMS without any link were not different regarding share of breakoff/partials from the 11.2 percent of those who did not receive any SMS (b = .98, SE = .70, p = .162).

Figure 3. *Detailed overview of breakoff/partials for Study 3*



Similarly, in Study 4, 7.2 percent of those who received a general SMS link to the online questionnaire combined with login credentials were defined as breakoff/partials, which was not significantly different from the 7.4 percent of those who received an SMS without any link (b = .12, SE = .1.60, p = .940). In the same study, those who received an SMS without any link were not significantly different to the 7.0 percent of those who did not receive any SMS (b = .29, SE = 1.60, p = .858). There was no significant difference between the experimental groups in percentage of questions answered in Study 3 or 4.

DISCUSSION

The four studies analyzed in this report show that sending SMS reminders to sample persons had a positive effect on response rates, but also that the content of the SMS affected both response rates and data quality in terms of breakoff/partials. Lowering the threshold of accessing questionnaires is important for increasing response rates amongst sample persons. In Study 1 and 2, providing the sample persons with easily accessible direct links to the online questionnaire without any need for them to fill out any login credentials increased response rates, but at the expense of the data quality. Therefore, the direct links without login credentials were not sent out for Study 3 and 4 conducted one year later. In these latter studies, SMS messages which simply reminded the sample persons about the previous postal invitations had a greater effect on response rate than sending no SMS messages at all. However, the strongest effect on response rate was observed among sampled persons between 16 and 29 years when sending SMS messages including a link to the online questionnaire combined with login credentials, compared to when sending an SMS without any link.

We conclude from these studies that sending a link to the online questionnaire lowered the threshold well enough for the sample persons to find the questionnaire easily accessible. But when including the login credentials the sample persons were forced to invest a certain level of concentration and commitment before initiating participation, which lowered the share of breakoff/partials. Thus, sending an SMS reminder including a link with login credentials had a positive enough effect on response rates to outweigh the modest negative effect on data quality.

REFERENCES

American Association for Public Opinion Research. (2023). Standard definitions: Final dispositions of case codes and outcome rates for surveys (10th ed.). https://aapor.org/wp-content/uploads/2023/05/Standards-Definitions-10th-edition.pdf

Andreadis, I. (2020). Text Message (SMS) Pre-notifications, Invitations and Reminders for Web Surveys in Survey Methods: Insights from the Field, *Special issue: 'Advancements in Online and Mobile Survey Methods'*. Retrieved from https://surveyinsights.org /?p=13551.

Antoun, C., Couper, M. P., & Conrad, F. G. (2017). Effects of mobile versus PC web on survey response quality: A crossover experiment in a probability web panel. *Public Opinion Quarterly, 81*(S1), 280–306. https://doi.org/10.1093/poq/nfw088

Groves, R. M., Singer, E., & Corning, A. (2000). Leverage-Saliency Theory of Survey Participation: Description and an Illustration. *The Public Opinion Quarterly*, *64*(3), 299–308. http://www.jstor.org/stable/3078721

Lee, S., Kim, H., Couper, M. P., & Woo, Y. (2019). Mobile web surveying in Korea: The impact of smartphone optimization and SMS invitation. *Social Science Computer Review, 37*(6), 836–853. https://doi.org/10.1177/0894439318756867

McGeeney, K., & Yan, H. Y. (2016, September 7). Text message notification for web surveys. *Pew Research Center*. https://www.pewresearch.org/methods/2016/09/07/text-message-notification-for-web-surveys/

Mavletova, A., & Couper, M. P. (2014). Mobile web survey design: Scrolling versus paging, SMS versus e-mail invitations. *Journal of Survey Statistics and Methodology, 2*(4), 498–518. https://doi.org/10.1093/jssam/smu015

Stiftelsen för Internetinfrastruktur. (2024). *Svenskarna och internet 2024*. Internetstiftelsen. https://svenskarnaochinternet.se/rapporter/svenskarna-och-internet-2024/sammanfattning/

Link, M. W., Murphy, J., Schober, M. F., Buskirk, T. D., Childs, J. H., & Tesfaye, C. (2014). Mobile technologies for conducting, augmenting and potentially replacing surveys: Report of the AAPOR Task Force on Emerging Technologies in Public Opinion Research. *Public Opinion Quarterly, 78*(4), 779–787. https://doi.org/10.1093/poq/nfu054opinion research. Public Opinion Quarterly, 78, 779–787. Crossref. Web of Science.

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For more information, please contact us at info@som.gu.se