

The Effects of Sequencing and Time of Text Message on Completion Rates, Data Quality, and Nonresponse

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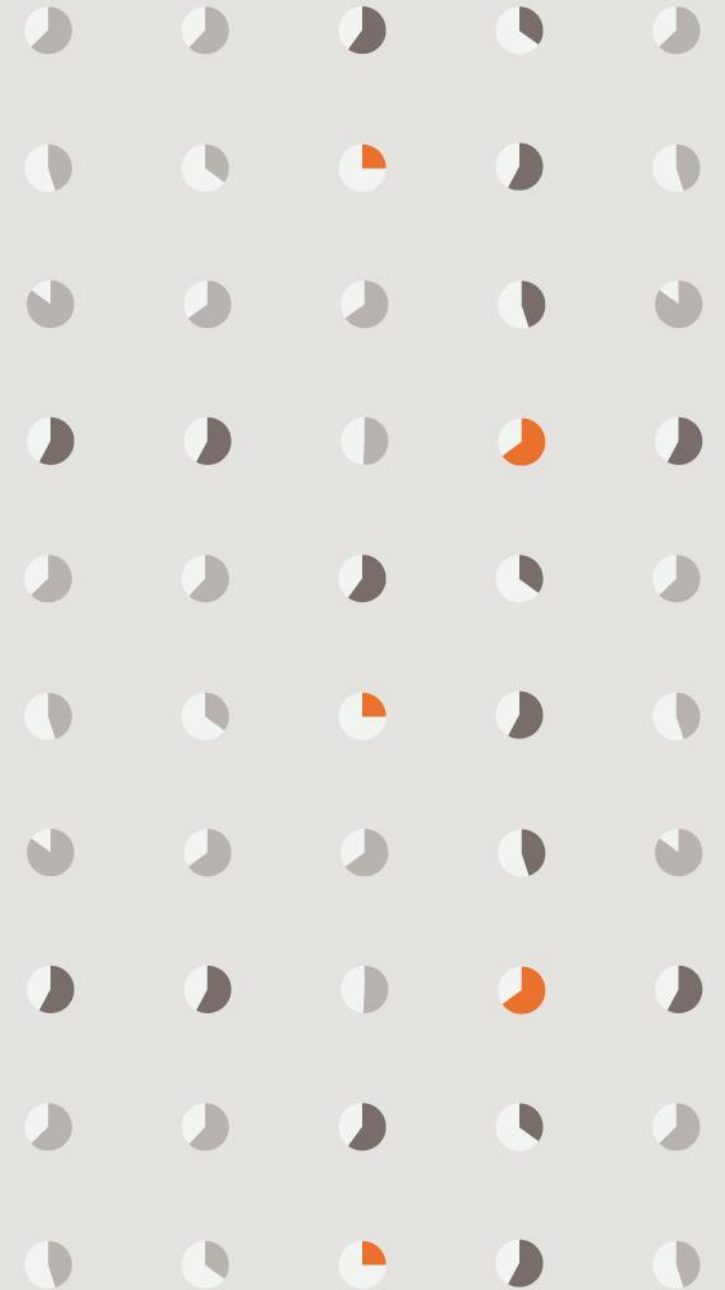


Outline

01 Background and Study Design

02 Findings

03 Conclusions and Future Research



Background and Study Design

Texting is emerging as a contact mode for surveys, but more research is needed on how best to integrate texting in mixed mode designs

Contact Modes

Mixed-mode contact designs can improve response rates and representativeness

Text Notices/Invites

Prenotifications have had mixed effects; invitations may not be as effective as reminders

Text Reminders

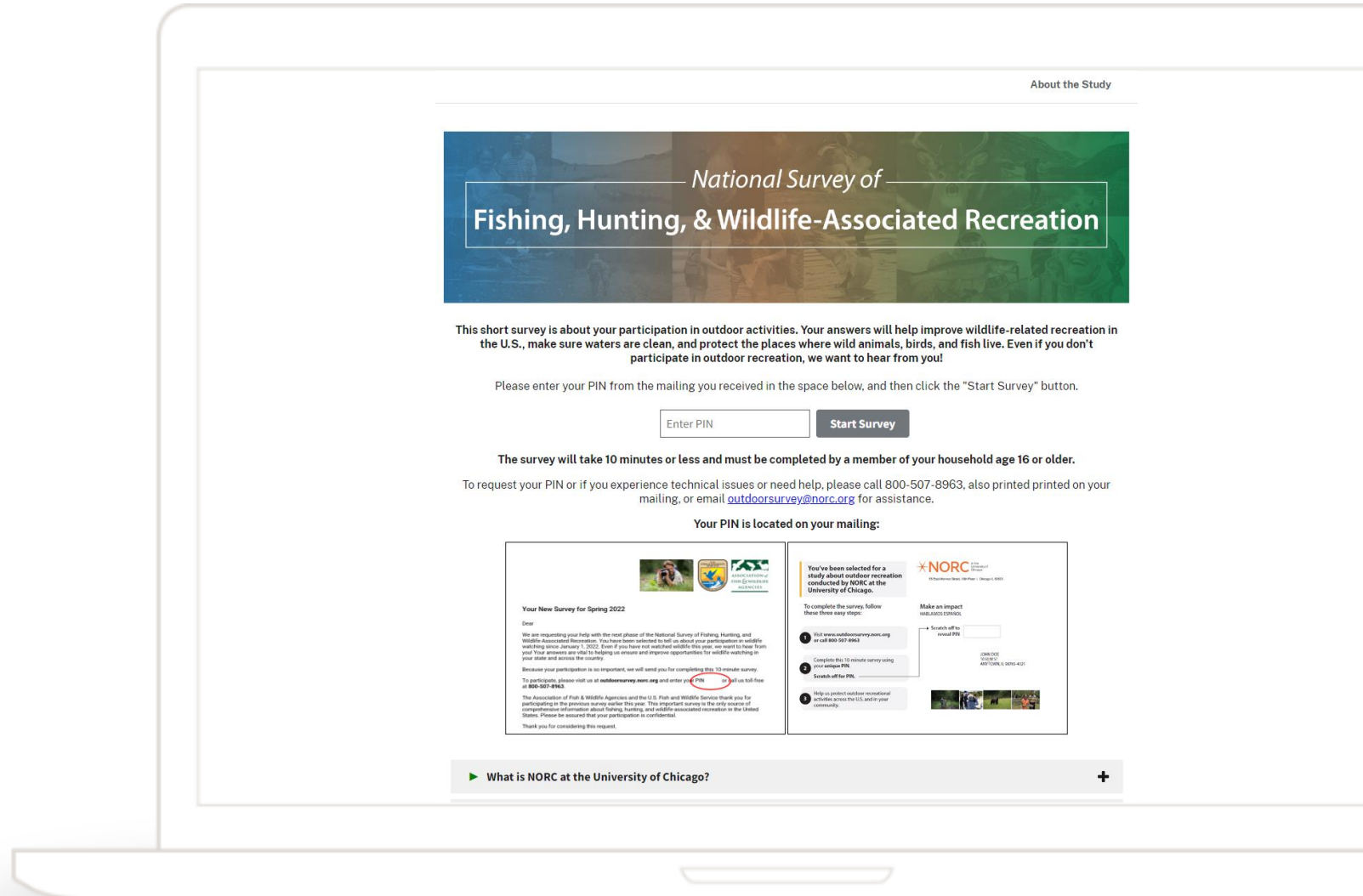
Sending reminder text messages have been effective at improving response rates and representation

Time of Day

Very little research on when is the best time of day to send text messages

Data from the 2022 National Survey of Fishing, Hunting, & Wildlife-Associated Recreation

- A mixed-mode web-first design with web, telephone, and paper questionnaires
- Design included a screener instrument to identify those who participate in fishing, hunting, and wildlife watching activities and three waves of surveys
- The text messaging experiment was conducted in Wave 2 among respondents who consented to receive text messages during screening



Randomly assigned to sequencing and timing experiment within sample group

- **Two sample groups**
 - Group A: Respondents who completed Wave 1 after receiving a text message
 - Group B: Remaining Wave 1 completers and screener respondents who did not respond in Wave 1
- **Experimental variables**
 - Sequencing
 - Text invite
 - Early text reminder
 - Late text reminder
 - Time of messaging
 - Morning
 - Afternoon

EXPERIMENTAL GROUPS

<i>Sequencing</i>	<i>Time of Messaging</i>		<i>Total</i>
	<i>Morning</i>	<i>Afternoon</i>	
1. Invite, Early Reminder	573	607	1,180
2. Invite, Late Reminder	574	571	1,145
Group A Total	1,147	1,178	2,325
3. Invite	2,622	2,679	5,301
4. Early Reminder	2,560	2,573	5,133
5. Late Reminder	2,631	2,636	5,267
Group B Total	7,813	7,888	15,701

Outcome measures analyzed



Completion Rates

Cumulative and final completion rates

Completion rates by mode



Response Speed

Number of days between the 1st contact date and the completion date



Data Quality

Web response time

Web and paper item nonresponse rates



Nonresponse Bias

Absolute relative nonresponse bias, for each category and overall

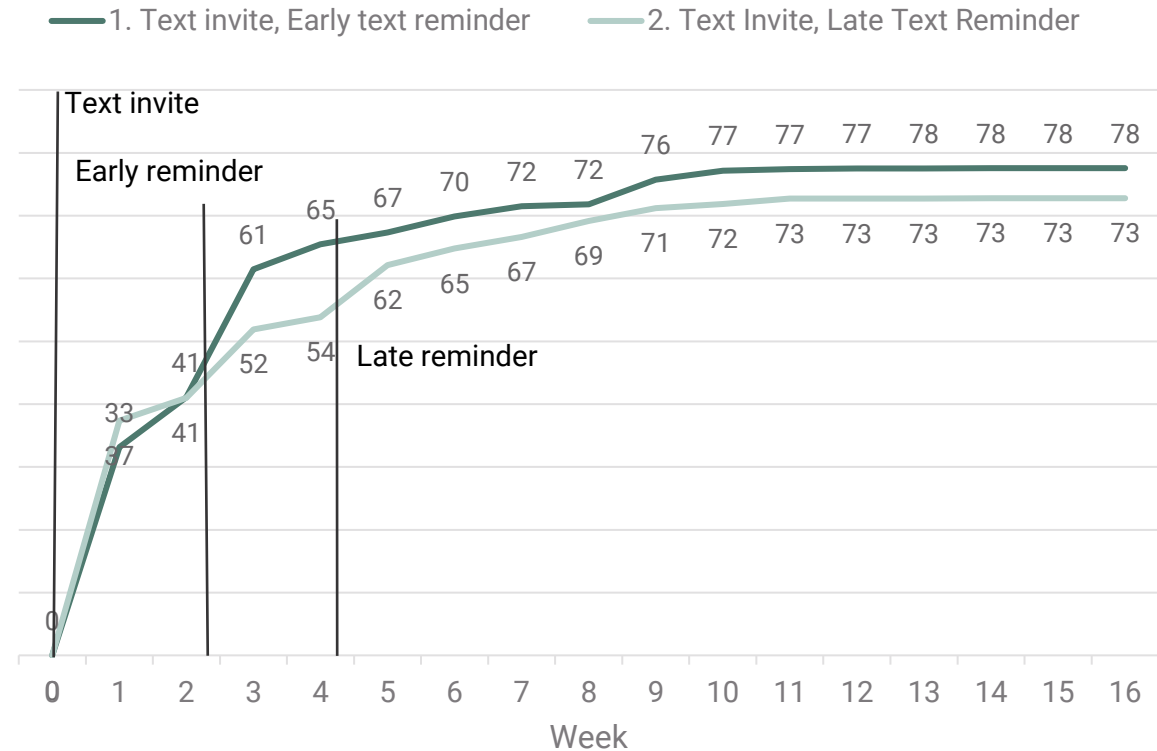
Findings

Sequencing

Texting had a positive impact on completion rates

- A text invite was sent to both conditions in Group A and created an initial boost in the completion rate
- The early and late text reminders resulted in an increase in the completion rate in the week after they were sent
- The early text reminder was somewhat more effective than the late text reminder, especially in boosting completion early in the field period; earlier response can help save mailing and other outreach costs

**WEEKLY CUMMULATIVE COMPLETION RATE
GROUP A**

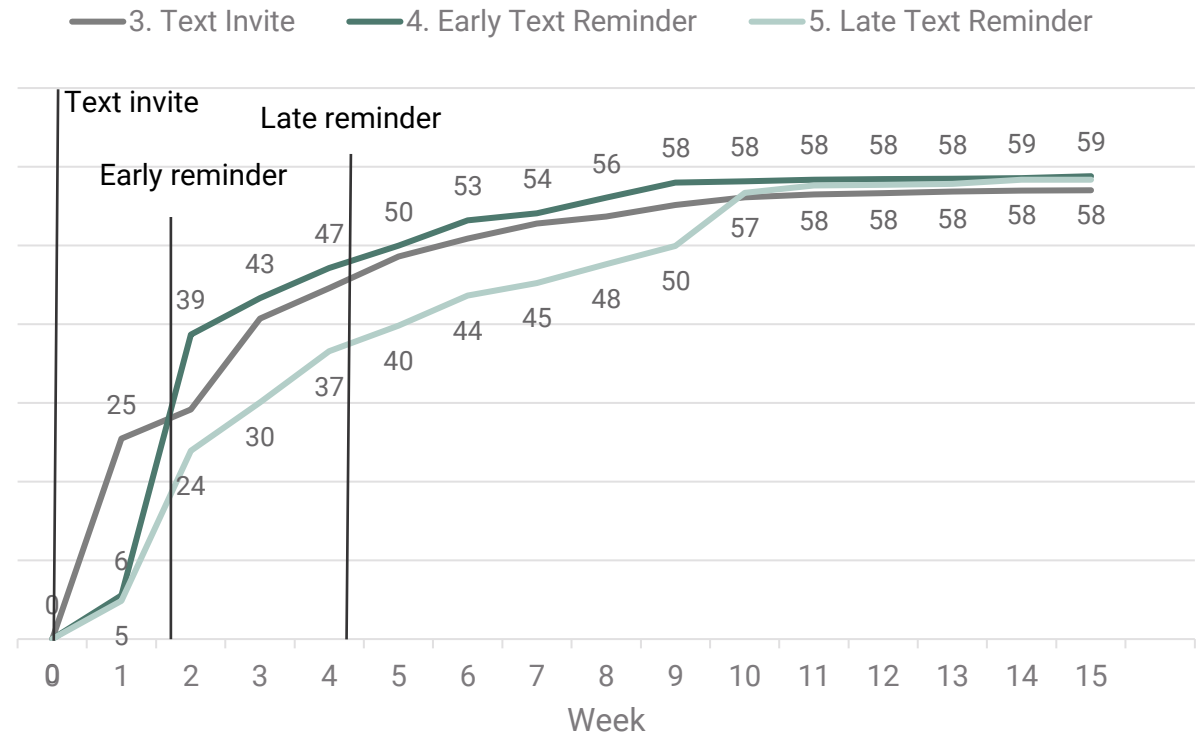


Note: Completion rates were base weighted to account for unequal probability of selection

Early text reminder created large increase after week 2

- The text invite condition had an initial boost in the completion rate after the invitation was sent
- The early text reminder condition had the highest completion rates early in the field period, after the text reminder was sent (like for Group A)
- The late text reminder condition lagged behind the other groups
- The completion rates evened out late in the field period, after week 9

**WEEKLY CUMMULATIVE COMPLETION RATE
GROUP B**



Note: Completion rates were base weighted to account for unequal probability of selection

No significant differences in final completion rates

- The differences in the final completion rates by condition were not significant
- Most of the responses came in via the web; completion rates by mode were also similar between conditions
- Texting appears to improve the completion rate compared with no texting (the quasi-control group had the lowest overall response rate)

COMPLETION RATES BY CONDITION AND BY MODE

<i>Group A</i>	Overall	Web	Paper	Phone
1. Invite, Early Reminder	77.6%	66.0%	4.3%	7.4%
2. Invite, Late Reminder	72.8%	62.3%	2.4%	8.1%
<i>Group B</i>	Overall	Web	Paper	Phone
3. Invite	57.2%	54.6%	1.3%	1.3%
4. Early Reminder	58.8%	54.7%	2.2%	1.8%
5. Late Reminder	58.4%	55.3%	2.2%	0.9%

Note: Completion rates were base weighted to account for unequal probability of selection

Early text reminder group responded more quickly via web

- No significant differences between Group A conditions
- For Group B, the early text reminder was the most effective at getting the sampled members to complete the web survey as quickly as possible
- The paper response time was also faster for those who received a text reminder than those who received the text invite

RESPONSE TIME BY CONDITION

<i>Group A</i>	Web	Paper
1. Invite, Early Reminder	11.5 days	63.4 days
2. Invite, Late Reminder	11.7 days	63.5 days
<i>Group B</i>		
3. Invite	18.2 days	63.8 days
4. Early Reminder	13.4 days	53.3 days
5. Late Reminder	21.0 days	53.3 days

Data quality metrics similar across conditions

- No significant effects of sequencing on web response time or item nonresponse to the web or paper modes

WEB RESPONSE TIME AND ITEM NONRESPONSE RATE BY CONDITION

<i>Group A</i>	Web Response Time	Web Item Nonresponse	Paper Item Nonresponse
1. Invite, Early Reminder	8.1 min	1.3%	5.2%
2. Invite, Late Reminder	8.0 min	1.2%	5.5%
<i>Group B</i>			
3. Invite	7.0 min	0.9%	5.2%
4. Early Reminder	7.2 min	1.0%	2.5%
5. Late Reminder	7.1 min	0.8%	3.5%

Nonresponse bias analysis

- Compare respondent demographics for each experimental condition to the corresponding proportion from the screener respondents
- **Absolute relative nonresponse bias:** the absolute ratio of the direct nonresponse bias and estimate derived from the screener completes
- **Average relative nonresponse bias:** average of the absolute relative nonresponse bias (ARNB) across all demographic comparisons

$$\text{Nonresponse Bias} = \bar{Y}_{r,demo} - \bar{Y}_{n,demo}$$

$$\text{Absolute Relative Nonresponse Bias} = \left| \frac{\bar{Y}_{r,demo} - \bar{Y}_{n,demo}}{\bar{Y}_{n,demo}} \right|$$

$\bar{Y}_{r,demo}$ unweighted estimated proportion derived from Wave 2 respondents to a given condition

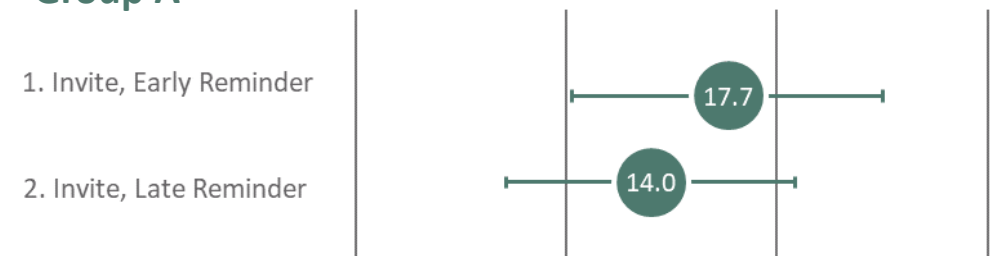
$\bar{Y}_{n,demo}$ unweighted estimated proportion derived from screener completes to a given condition

Demographics similar across sequencing conditions

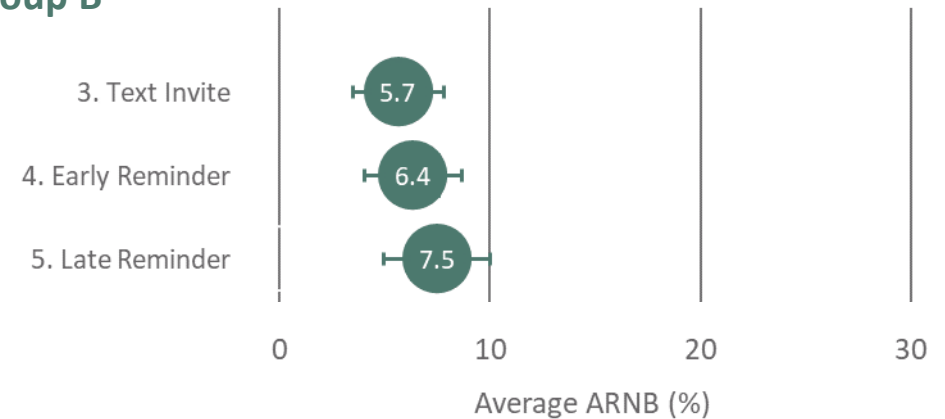
- No significant differences in individual demographic characteristics (household size, sex, age, race/ethnicity, education and urbanicity)
- The average of the absolute relative nonresponse bias across the demographics tested was also similar across the pair wise comparisons tested

AVERAGE ABSOLUTE RELATIVE NONRESPONSE BIAS

Group A



Group B



Time of Day

Time of messaging did not significantly impact completion rates

- No significant differences between completion rates when text messages were sent in the morning vs. afternoon

COMPLETION RATES BY CONDITION AND BY MODE

<i>Group A</i>	Overall	Web	Paper	Phone
Morning	73.1%	60.8%	3.9%	8.4%
Afternoon	77.7%	67.7%	3.0%	7.0%
<i>Group B</i>				
Morning	56.7%	53.6%	1.9%	1.2%
Afternoon	59.5%	56.2%	1.9%	1.4%

Note: Completion rates were base weighted to account for unequal probability of selection

Web and paper response times mostly similar

- No significant differences between Group A conditions
- For Group B, those who received the text message in the afternoon completed the web survey about a day faster than those who received the text message in the morning
- No significant differences between Group B conditions on response speed for paper completes

RESPONSE TIME BY CONDITION

<i>Group A</i>	Web	Paper
Morning	11.4 days	63.4 days
Afternoon	11.8 days	63.5 days
<i>Group B</i>		
Morning	18.2 days	56.6 days
Afternoon	16.9 days	56.1 days

Data quality similar by time-of-day condition

- No significant effects of time of text message on web response time or item nonresponse to the web or paper modes

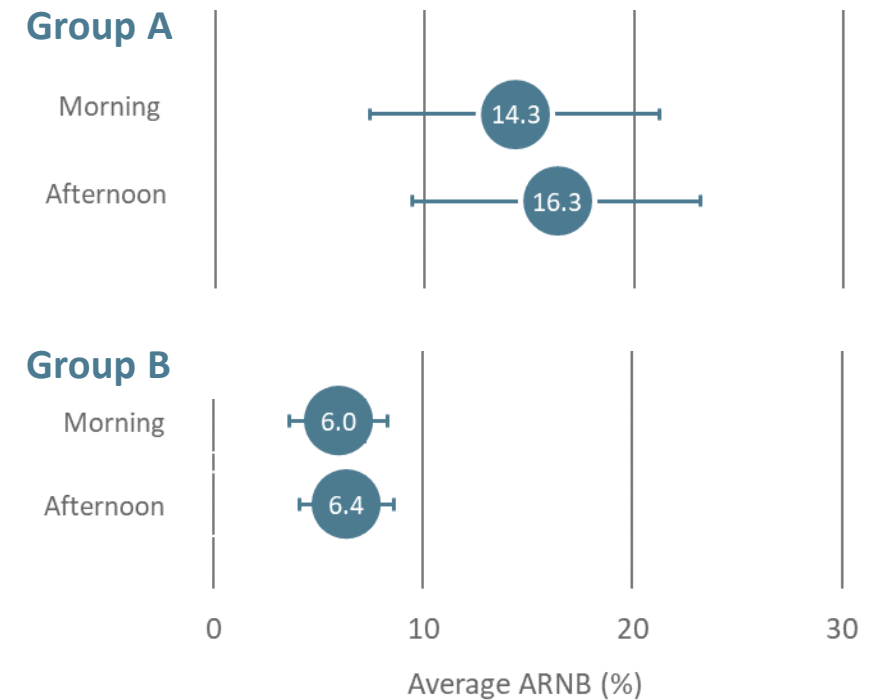
WEB RESPONSE TIME AND ITEM NONRESPONSE RATE BY CONDITION

<i>Group A</i>	Web Response Time	Web Item Nonresponse	Paper Item Nonresponse
Morning	8.0 min	1.0%	5.0%
Afternoon	8.1 min	1.5%	5.6%
<i>Group B</i>			
Morning	7.1 min	0.8%	4.1%
Afternoon	7.1 min	1.0%	3.2%

Nonresponse bias did not vary by time-of-day condition

- No significant differences in individual demographic characteristics or the average absolute relative nonresponse bias across the demographics tested

AVERAGE ABSOLUTE RELATIVE NONRESPONSE BIAS



Conclusions and Future Research

Text contacts are likely to play a key role in mixed-mode survey contact strategies, especially for surveys with short field periods

Text Sequencing

Text reminders may be more effective than text invites and an early text reminder was more effective than a late text reminder, shortening response time and raising completion early

Time of Day

Sending the text in the morning vs. afternoon did not have a significant impact on the outcome measures analyzed

Data Quality

Data quality measures were similar across the text sequencing and time of day conditions

Nonresponse Bias

Nonresponse bias did not significantly vary across the text sequencing or time of day conditions

Future research is needed to better understand how to use texting in mixed-mode survey contact approaches

Invitations and Reminders

- How does the combination of a text invite and text reminder impact response?
- Are multiple text reminders more effective than a single texting reminder?

Respondent Preference

- How do we incorporate respondent preference? For example, should we send email and text reminders or use only one mode based on what respondents prefer?

Panel and Longitudinal Surveys

- How does the use of texting vary for initial survey outreach vs. follow-up or ongoing outreach in multi-wave surveys, panels, and long-term longitudinal surveys?



Center for Panel Survey Sciences

The Center is dedicated to researching and developing best practices in probability-based panel surveys.

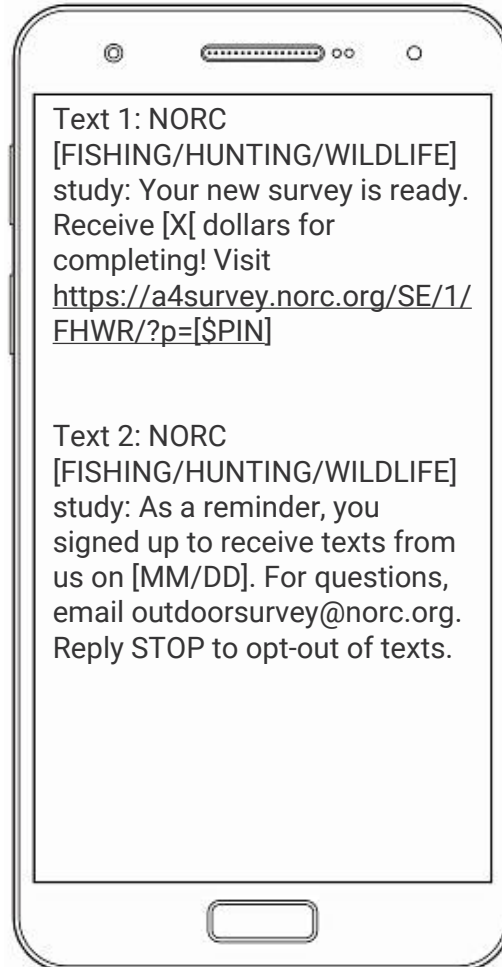
Learn more at **NORC's booth (401/403)** or **<https://www.norc.org/CPSS>**.

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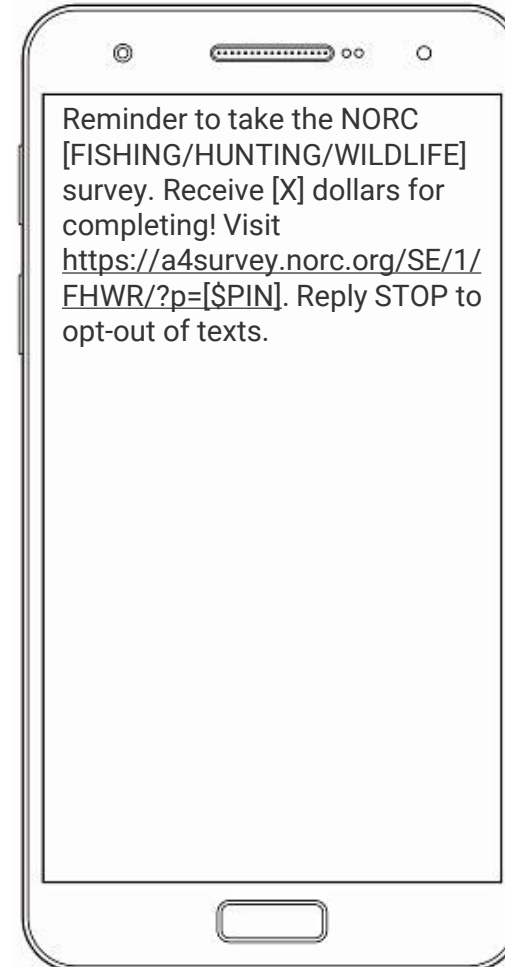
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Text invitation and reminder messages

Initial Invitation




Reminder





Thank you.

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