Timing Is Everything: Discreetly Discouraging Mobile Survey Response Through the Timing of E-mail Contacts

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Abstract

The proportion of web survey responses submitted from mobile devices, such as smartphones, is increasing steadily. This trend is problematic because mobile responses are associated with increased breakoffs, item nonresponse, and other data quality issues. Careful web survey design can mitigate some of these concerns, but cannot eliminate them entirely. As a result, survey practitioners typically prefer that respondents not respond via mobile devices. Web surveys can be programmed to block mobile responses, but this approach is discouraged because of its potential to increase nonresponse (Buskirk & Andrus, 2012). Ideally, researchers need a way to discourage mobile response without impacting response rates. In this paper we evaluate a strategy for discretely discouraging mobile responding.

The Campus Climate Survey Validation Study Pilot Test, sponsored by the Bureau of Justice Statistics and the Office on Violence Against Women, is a survey of college students at nine U.S. institutions of higher education. Over 23,000 respondents completed the survey among a random sample of approximately 50,000 students. Although schedules vary across students and institutions, we suspect college students are less likely to respond via mobile devices during certain times of the day than others. For example, in the early evening on a Monday, they may be more likely to be using a computer to complete assignments, and thus less likely to respond via mobile devices. Using data on the day and time a response was submitted as well as the day and time a respondent was last emailed a request to complete the survey, we identify the times that are most likely to result in non-mobile responses. Because web survey response typically spikes immediately after invitations and reminders are sent, the findings of our research can be used to carefully time email contacts in an attempt to discretely discourage mobile responding among a college student sample.

Key Words: Mobile, e-mail reminders, e-mail invitations, timing, students, optimizing data quality

1. Introduction

The purpose of this research is to explore how changes in the timing of e-mail contacts may impact the proportion of web survey respondents who complete a survey on a mobile device, such as a smartphone or tablet. We focus on the college student

population, which differs from the general population in terms of (1) mobile device usage and (2) times of availability for completing a web survey.

2. Background

Rates of smartphone and tablet ownership are rising. In just the four years between 2011 and 2015, smartphone ownership nearly doubled (increasing from 35% to 68%) and tablet ownership increased more than fivefold (from 8% to 45%), according to the Pew Research Center (2015a). (See **Figure 1**.)

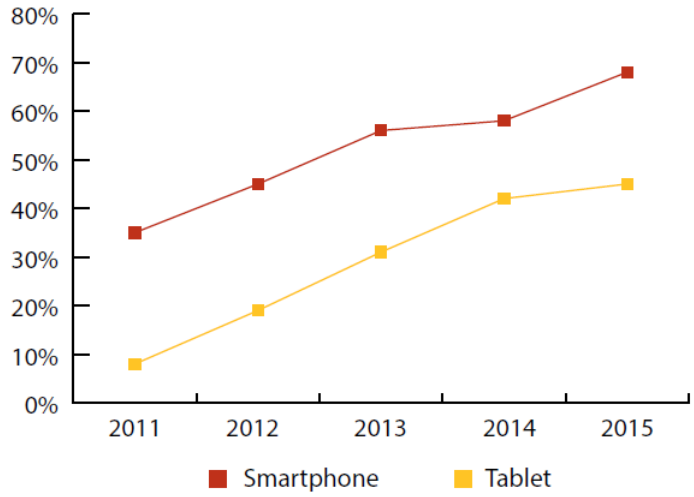


Figure 1: Mobile device ownership (U.S. adults)

Young adults – those between the ages of 18-29 – are most likely to own smartphones (Anderson, 2015). (See **Figure 2**.) Young adults also rely more heavily on their smartphones for accessing a wide range of services and content, with many reporting that they use their smartphone for online banking, to apply for a job, or to access educational content (Pew Research Center, 2015b).

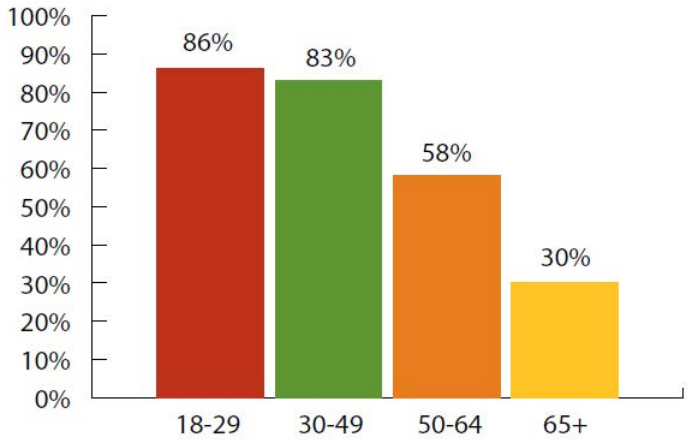


Figure 2: U.S. smartphone ownership by age

The rise in mobile device ownership has led to an increase in mobile survey response. Mobile response is so common now that a 2014 report of the AAPOR Task Force on Emerging Technologies in Public Opinion Research states, "If you are conducting online surveys, you are conducting mobile surveys" (Link et al., 2014).

Mobile responding introduces a host of issues (e.g., Antoun, 2015), including increased breakoff rates; a higher likelihood that respondents are multi-tasking, distracted, and/or away from home when completing a survey; longer survey completion times; increased concern among respondents about providing sensitive information; and potentially poorer data quality (but these findings are mixed). Approaches to handling these mobile response issues include discouraging respondents from completing surveys on mobile devices or even programming surveys to block mobile devices. However, these approaches can negatively impact response rates (e.g., Buskirk & Andrus, 2012).

Our main objective was to investigate how we can minimize mobile response rates without impacting overall response rates. Our focus was on the college student population, which is unique with respect to mobile device usage and computer access, and particularly the times at which they use these devices. We made the following assumptions about the college student population, as a whole. First, students' computer access varies throughout the day. Computer access is most likely at certain times, such as when students do homework/study, and less likely at other times, such as when they go out on weekends. Second, although there is variation across students and schools, there are certain *time of day* and *day of week* combinations at which the college student population is more likely to have computer access. And third, students are more likely to complete a survey from a computer than a mobile device if they take the survey when a computer is readily accessible.

Web survey response typically spikes shortly after invitation or reminder e-mails are sent. Most responses are received that same day and response tends to decline quickly thereafter (Callegaro et al., 2015). With that in mind and considering our assumptions about college student samples, we may be able to minimize the proportion of mobile respondents by e-mailing sample members when we anticipate they are more likely to be at or near a computer.

3. Methods

Our data are from the Campus Climate Survey Validation Study Pilot Test (Krebs et al., 2016). The study was sponsored by the Bureau of Justice Statistics (BJS) and the Office on Violence Against Women. BJS contracted with RTI International to collaborate on the design and implementation of the study. The purpose of the study was to develop a comprehensive methodology for surveying college students to develop accurate measures of the rates and characteristics of unwanted sexual contact and campus climate related to sexual harassment and assault.

The sample consisted of approximately 50,000 students from 9 U.S. colleges and universities. There were about 23,000 respondents to the survey, for response rates of 54% for females and 40% for males (AAPOR RR3).

Sample members received one invitation e-mail and up to five reminder e-mails if they had not yet completed the survey. E-mail schedules varied across schools to account for

differences in academic calendars and within schools to increase the odds of response and to accommodate special requests from certain schools. **Figure 3** presents the frequency of e-mails sent across all schools by the day and time e-mails were sent. This figure illustrates the variation in the days and times that invitations and reminders were sent. Monday was the most common day that e-mails were sent to sample members, and the fewest reminders were sent on Sundays. While e-mails were sent across all time periods, the majority of e-mails were sent between 12:00 PM and 2:59 PM.

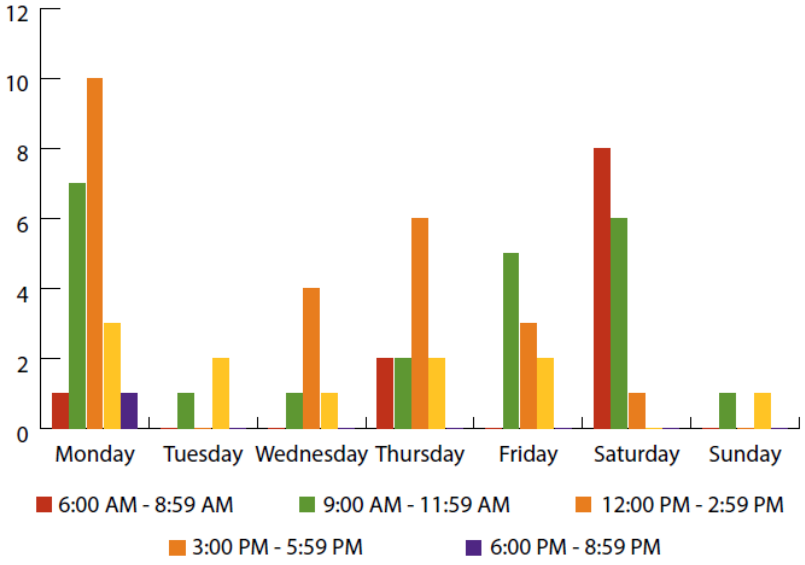


Figure 3: Number of e-mail reminders by day and time

One school was excluded from analysis because rates of mobile response at that school differed considerably from other schools. Including this school would have confounded the comparison of mobile and non-mobile responses because e-mail times were not experimentally varied across schools. All cases at the other eight schools that provided informed consent were included in the analysis (n=20,210), including completes and breakoffs.

Our analysis consisted of three steps:

1. Examine the elapsed time between when each respondent was last sent an e-mail reminder and when that student responded. Analyses concerning date and time of response used the start time of the respondent's last connection.
2. Compare the distribution of response across mobile and non-mobile platforms by day of week, time of day, and the interaction between day of week and time of day to determine the time periods most likely to result in a mobile completion.
3. Compare breakoff rates by time of day and day of week to determine if there were differences based on when the respondent started the survey.

4. Results

Figure 4 presents the amount of elapsed time from when a reminder went out to when a student responded. Responses came in quickly after invitation and reminder e-mails were sent: 30% of respondents completed the survey within 4 hours of receiving an e-mail, and

responses tapered off soon after. Respondents on mobile devices responded more quickly than non-mobile respondents.

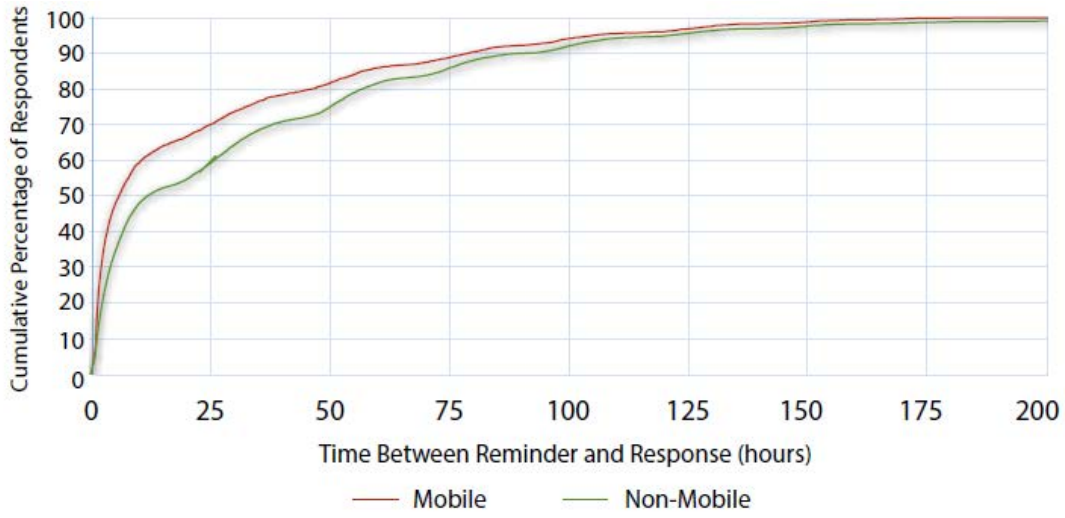


Figure 4: Elapsed time between e-mail reminder and response

About one-quarter of respondents completed the survey on a mobile device, and the vast majority of mobile respondents completed the survey on a smartphone rather than a tablet, as displayed in **Figure 5**:

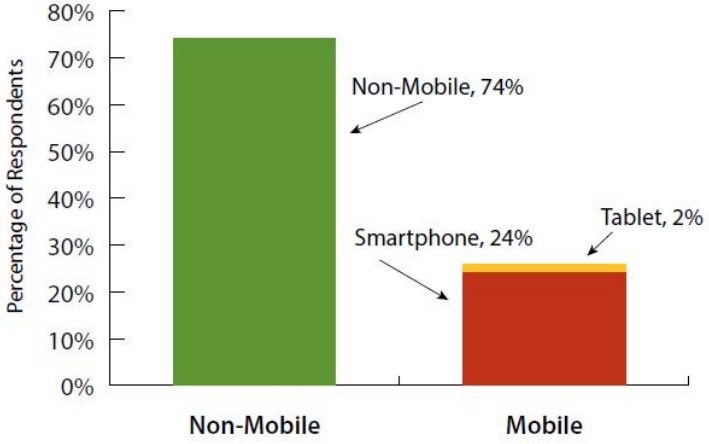
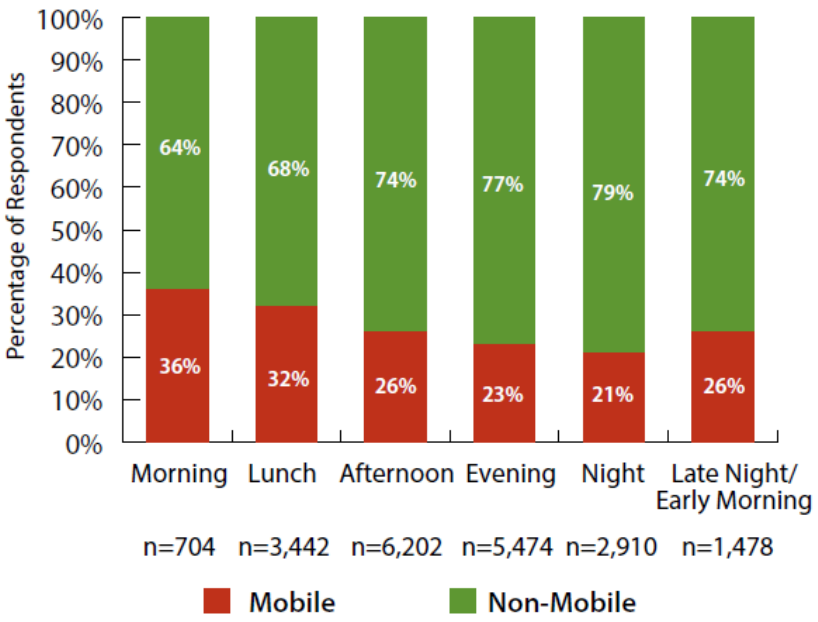


Figure 5: Percentage of respondents by device

Mobile response was most likely in the morning and declined throughout the day, as displayed in **Figure 6**:



Note: Morning = 6:00 AM–9:59 AM, Lunch = 10:00 AM–12:59 PM, Afternoon = 1:00 PM–4:59 PM, Evening = 5:00 PM–8:59 PM, Night = 9:00 PM–11:59 PM, Late Night/Early Morning = 12:00 AM–5:59 AM

Figure 6: Mobile vs. non-mobile distribution by time of response

Mobile response was lowest on Sundays and remained low in the early part of the week before rising as the weekend neared. (See **Figure 7**.)

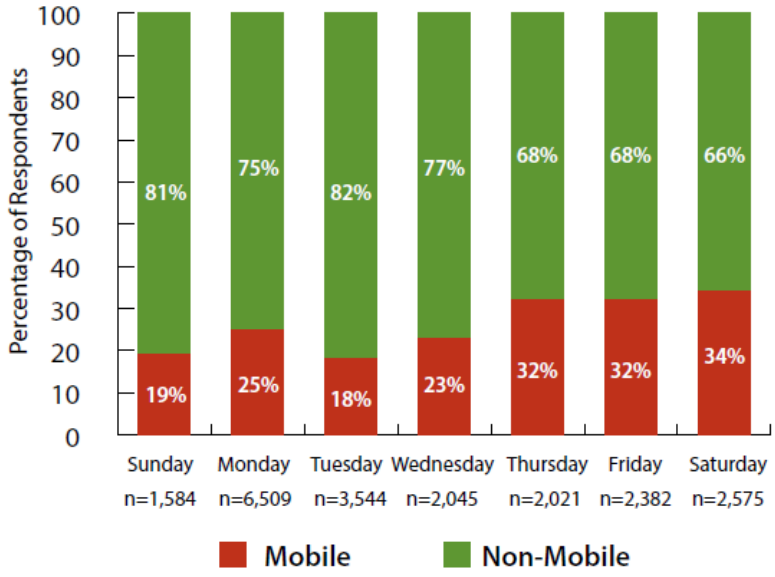


Figure 7: Mobile vs. non-mobile distribution by day of response

As displayed in **Figure 8**, Mobile respondents were more likely to break off. Breakoff rates for mobile respondents were highest in the morning (6:00 AM–9:59 AM) and afternoon (1:00 PM–4:59 PM).

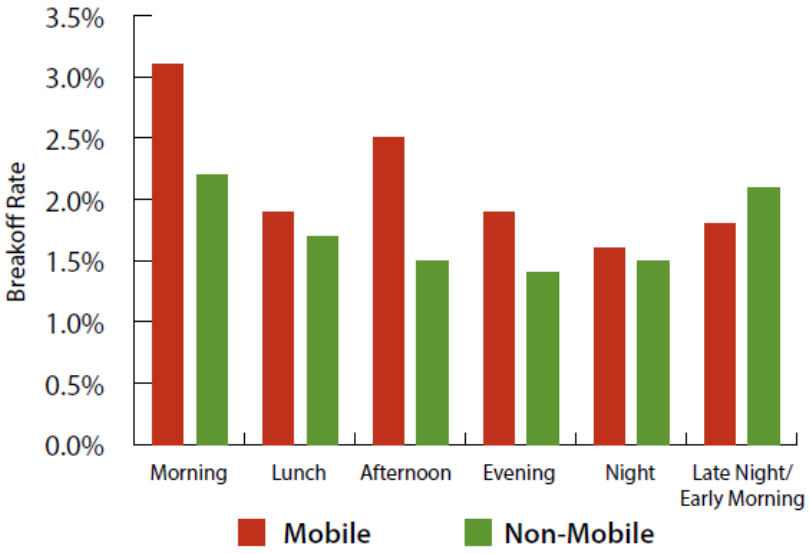


Figure 8: Breakoffs by time of day and device

There was no apparent pattern in breakoffs by day of week and device (not shown), but for all day and time combinations except one, mobile breakoff rates exceeded non-mobile breakoff rates.

5. Discussion

This research provides a preliminary look at how the timing of e-mails may impact mobile responding with a college student sample. We found that one-fourth of respondents completed the survey on a mobile device. As expected, the majority of responses were submitted soon after respondents received an e-mail reminder about the survey. Mobile respondents completed the survey more quickly after a reminder than non-mobile respondents.

The time of day with the greatest percentage of mobile responses was the morning (6:00 AM–9:59 AM). This was also the time with the highest breakoff rate, suggesting that morning may not be the best time to e-mail this population. Evening (5:00 PM–8:59 PM) and nighttime hours (9:00 PM–11:59 PM) appear to be optimal with respect to minimizing mobile response. With respect to day of the week, mobile response was greatest leading into the weekend (Thursday through Saturday) and lowest on Tuesdays and Sundays, which we surmise are prime homework days (i.e., respondents are more likely to be at a computer).

Our findings are not without limitation. First, our results are limited by our non-experimental design. The results may be confounded by e-mail schedule variation across schools and other factors that impact mobile response (e.g., student demographics, class schedules). Second, our findings are likely not generalizable to other populations because college students have unique schedules and different patterns of mobile device usage compared to the general population. And third, the available time variable was the time of last connection. Most respondents completed the survey in one session, but for those who did not, the variable recorded the date and time of their last connection rather than when they initially responded to the survey request. It is useful to know when respondents

actually completed the survey, but it would also have been useful to know the time of initial response.

Despite these limitations, our findings across the schools overall provide insight into when college students may be most and least likely to respond via mobile device. More research is needed to experimentally compare the impact of e-mail timing on mobile response, both among a college student population and other populations. Our preliminary analyses suggest it may be possible to minimize mobile response through carefully timed e-mails.

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